NetworkWorld

Netscape expands vision
Andreessen wants to connect everything. Page 10.

Feds consider taking back domain names

By Todd Wallack

Just when you thought the government was trying to get out of the Internet address business, a federal investigative office has suddenly recommended that Uncle Sam jump right back in.

In a 17-page confidential report, the National Science Foundation's (NSF) Office of the Inspector General (OIG) concluded last month that the agency is missing out on a prime source of revenue. By registering Internet domain names itself, the report argues, the NSF could collect millions in registration fees and recoup some of the government's investment in the 'Net.

The NSF has not doled out domain names since 1993, when it created the InterNIC registration system, now run by Network Solutions, Inc. (NSI). The pri-

Heath says the National Science Foundation's recommendations are surprising.

Go online for:
1032
- A copy of the NSF's original domain name agreement with NSI
- An overview of the Internet Society's proposal to increase the number of domains and domain registries
- A brief history of the Internet

www.nwfusion.com

Sun goes for browser gold

By Ellen Messmer
Mountain View, Calif.

When someone mentions the browser war, two combatants spring to mind — Netscape and Microsoft. But Sun wants you to think of a third.

Java giant Sun Microsystems, Inc. hopes to give both browser bigwigs a run for their money and market share, with the expected shipment this week of its HotJava Browser 1.0, written entirely in Java. Sun is expected to announce the release at this week's Internet World show in Los Angeles.
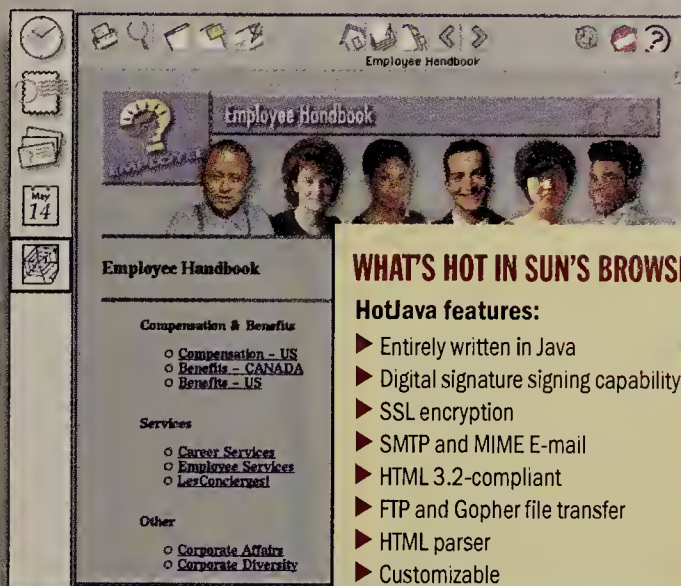
The Microsoft Corp.-Netscape Communications Corp. duopoly need not worry in the short term. Few analysts believe Sun will gain no more than a toehold at first. But in the long run, Sun could become a serious contender.

After all, Sun has gained widespread support for Java and a sensational amount of good pub-

licity. Microsoft meanwhile has been rocked with charges of unfair marketing practices and, more recently, security problems uncovered in its browser during the past two weeks, which may have shaken user confidence (*NW*, March 3, page 1 and see related story this week, page 8).

A strong browser, especially one based on Java, could help Sun tremendously. Instead of negotiating with browser vendors over Java implementations, Sun could simply craft its own strategy, without compromise or delay.

But Sun's browser is a bit of a puzzle. While it is chock full of features, it lacks one of the basics: a newsreader. And it is not yet available for the Macintosh

— just Solaris 2.5, Windows NT and Windows 95.

Free for general corporate download and use, the all-Java browser can display both European and Asian languages.

But in a departure from other browsers on the market, the Hot-

Java can be set up to allow applets to access local system resources based on the applet's signature. Java, in general, does not take advantage of specific PC features, such as drives, file systems or even printer drivers.

WHAT'S HOT IN SUN'S BROWSER?

HotJava features:
- Entirely written in Java
- Digital signature signing capability
- SSL encryption
- SMTP and MIME E-mail
- HTML 3.2-compliant
- FTP and Gopher file transfer
- HTML parser
- Customizable

Drawbacks:
- No newsgroup reader
- Requires Java Developers Kit 1.1 on computer platform

Tivoli tackles Java apps

TME 10 framework to run Java-based programs.

By Michael Cooney and Christine Burns
San Francisco

No one could accuse IBM's Tivoli Systems of resting on its laurels.

Tivoli is planning a major revision of its TME 10 framework — to be announced midsummer and delivered later this year — that will let the company's TME 10 management

Tivoli's Neath says Java is becoming an intricate part of managing enterprise resources.

products to control distributed Java applications over the World-Wide Web. This embedded Java Virtual Machine will let all future Java-based TME 10 management

NetPC spec pushes software to forefront

By John Cox

In a matter of days, Microsoft Corp. and Intel Corp. will release the first draft of the so-called netPC specification, which is aimed at making it easier and less expensive to run and manage Windows computers.

But do not expect to get all the benefits the two industry giants are promising when the first netPCs ship this summer. That is because the boxes will be

CISCO LOOKING A LITTLE BLUE

The New CISCO

By Jim Duffy
San Jose, Calif.

Is router king following in IBM's footsteps?

They say what goes around comes around.

Cisco Systems, Inc. has been a thorn in IBM's side for several years. The company has eaten IBM's lunch in the SNA-to-LAN internetwork migration and integration market. It attempted to derail IBM's Advanced Peer-to-Peer Networking initiative six years ago with its ill-fated Advanced Peer-to-Peer Internetworking. And Cisco is making believers out of users such as MCI Communications Corp. and USAA when it claims a channel-attached router can replace a front-end processor.

"Absolutely under no circumstances are we striving to [emulate IBM]."
Selby Wellman, senior vice president of business units, Cisco

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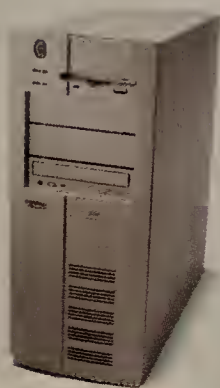
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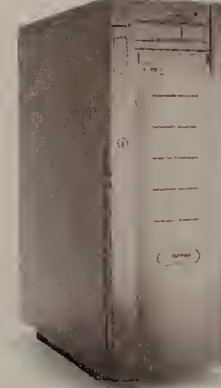
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NetworkWorldContents

March 10, 1997 Volume 14, Number 10

FEATURES

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This Week

Only on Fusion
- **Internet.** In an interview, Netscape CEO Jim Barksdale says his competitors have no Internet soul and admits he has a personal weakness (but won't say what it is). **DocFinder: 1037**
- **Broadband.** Everybody's heard of Netscape, but its record for the largest IPO in networking history has been broken by a little-known company that promises to boost fiber-optic bandwidth, which Wall Street figures is worth more than $3 billion. **DocFinder: 1038**
- **Legacy systems.** IBM hopes to use TCP/IP technology everywhere to breathe new life into its venerable product lines and put them in the heart of network-centric computing. **DocFinder: 1039**

This Week
- **Browsers.** It hasn't been a stellar week for Microsoft's Internet offerings, what with a security bug being discovered every other day in Internet Explorer. Download the patches to fix the holes from Microsoft and others, and read detailed overviews of how the bugs work from the people who found them. **DocFinder: 1031**
- **Java.** Download the latest copy of JavaSoft's Hot Java Web browser and "servlet" development kit. **DocFinder: 1033**
- **Routing.** Read our page 1 story about Cisco's dominance of the routing market, then come online for articles on everything from Cisco's attempts to steer Internet standards toward its Tag Switching plan, to its efforts to develop gigabit routers. **DocFinder: 1035**

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Sun finds its own holes

Perhaps spurred by Microsoft's security misfortunes last week, Sun Microsystems, Inc. ran a security audit on its new Java Developers Kit 1.1. The company discovered that it would be possible to crash the Java Virtual Machine if an attacker managed to slip "evil byte code" past the tool kit's verifier. Saying "the theoretical attack is complex and extremely difficult to exploit," Sun issued a patch and delivered it to Java licensees. Information is available at www.javasoft.com/sfaq.

Corel herds video into new corral

Corel Corp. is planning to spin off its video division into a separate company sometime within the next two to three months, sources familiar with the plan said. The name of the new company has yet to be determined. Plans call for the spin-off first to be a wholly owned subsidiary and eventually an affiliate of Corel, sources said.

Microsoft directory rolls out Java welcome mat

Microsoft Corp. is inviting Java to participate in its upcoming Windows NT 5.0 directory service. Enzo Schiano, Windows NT Server group product manager, last week said before this summer the company will release a beta version of its Active Directory Services Interface software developers' kit that includes Java extensions. These extensions will let Java applications use the NT 5.0 Active Directory to gain simultaneous access to other Lightweight Directory Access Protocol-based directories as well as Windows NT 4.0 domain and Novell Directory Service information.

Other Microsoft doin's

Microsoft Corp. and Software AG of North America, Inc. announced last week that beta versions of ActiveX will be available on leading Unix platforms. Software AG released a beta for the Sun Solaris platform, and later this month betas will be available for Digital Unix and Linux operating systems. All versions will be out for general use in April.

Microsoft also announced it has acquired Interse Corp., a Sunnyvale, Calif.-based developer of Web site analysis software. Microsoft plans to integrate the Interse software into the BackOffice server suite.

There's still time to join the horde

The Federal Communications Commission has received a whopping 400,000 E-mail comments on its recent Notice of Inquiry regarding Internet service providers. The crush of messages (to isp@fcc.gov) at one point overloaded one of the FCC's mail servers, confirmed FCC attorney Kevin Werbach, but the agency's IS staff has now added more capacity. The FCC is asking whether the regulatory status of ISPs exempting them from paying per-minute access charges to local phone companies should be changed. Comments are due March 24.

UUNET makes IDSL connection

UUNET Technologies is announcing Digital Subscriber Line (DSL) services this week at Spring Internet World '97. In conjunction with its parent company, WorldCom, Inc., UUNET's ISDN DSL (IDSL) service will be based on Ascend Communications, Inc.'s gear. IDSL lets end users deploy traditional ISDN terminal adapters at their site instead of the more expensive Asymmetric DSL devices used with other vendors' products. IDSL also offers users a dedicated 128K bit/sec connection for much less than a dedicated private line, said Alan Taffel, vice president of marketing and business development at UUNET. While the Internet service provider would not reveal rollout plans or pricing, Taffel confirmed its IDSL services will be available nationally.

Start-up wants ATM on every desktop

By Jodi Cohen
Minneapolis

Not everyone has given up on ATM to the desktop.

Start-up Switched Network Technologies, Inc. (SNT) next month will unveil its first products, including an ATM workgroup switch that offers twice the performance and more than three times the port density as a similar device from competitor FORE Systems, Inc. but costs about half as much per port.

The EntraSwitch — part of SNT's EntraLAN end-to-end family of ATM products optimized for Microsoft Corp. and Novell, Inc. LANs — is a 12-slot chassis that boasts a switching capacity of 5.8G bit/sec. The switch, which is designed to help customers build corporate intranets by linking high-performance servers to client desktops, supports as many as 72 25M bit/sec or 12 155M bit/sec connections. Customers can buy SNT's switch fully loaded with 25M bit/sec interfaces for $405 per port, which includes the company's net management application.

By comparison, FORE's ForeRunner ASX-200WG 2.5G bit/sec workgroup switch supports just 24 ATM ports and costs $764 per port, when factoring in the price of the vendor's separate net management software, according to FORE.

"[SNT's] low price point makes ATM look very attractive to folks who may not even be considering ATM in the workgroup today," said Glenn Gabriel Ben-Yosef, president of Clear Thinking Research, Inc., a Boston-based consultancy. "With such a low price, it makes sense for new networks to go directly to ATM."

Ben-Yosef also said it is unfortunate that most vendors — such as ATM LAN leader FORE — are primarily focusing on ATM as a core backbone technology, because future applications will require the isochronous nature of ATM in the workgroup.

But the backbone is where all the ATM action is. Worldwide ATM LAN sales tripled in 1996 to $471 million, with more than 90% of sales coming from high-speed backbone products, according to Dell'Oro Group, a consultancy based in Portola Valley, Calif.

But SNT thinks its ATM gear is a good match for the workgroup because the company has kept its cost and complexity to a minimum.

In addition to its switch, SNT will roll out a 155M bit/sec ATM adapter card, dubbed EntraServ, for high-performance servers, which perform many onboard functions such as segmentation and reassembly, freeing up server memory and cycles to process user network traffic.

For PC clients, SNT will offer EntraNIC adapters that provide either 25M or 155M bit/sec connectivity to desktops.

One interesting software feature that SNT will offer for its EntraLAN product family is the ability to create redundant fault-tolerant connections.

EntraSwitch, including SNT's net management application, is priced at $16,000. Individual port modules cost $1,100. The 155M bit/sec server card costs about $3,500, and 25M and 155M bit/sec client adapters cost $275 and $545, respectively. All products will ship in May.

©SNT: (612) 519-9700.

UP, UP AND ATM

Switched Network Technologies is going after the worldwide ATM LAN switching market, which is expected to explode to $2.7 billion by the year 2000.

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
(In billions), $3.0, $2.5, $2.0, $1.5, $1.0, $0.5, 0
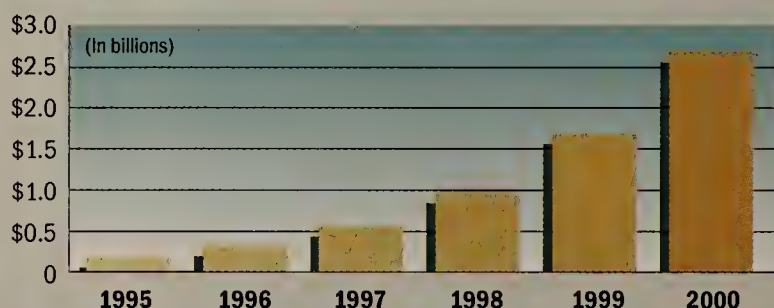
SOURCE: IOC, FRAMINGHAM, MASS.

Vendors get pushy at Internet World

By Carol Sliwa, Ellen Messmer and Christine Burns
Los Angeles

Still the rage, push technology will head in a new direction thanks to an alliance between Intermind Corp. and Simware, Inc. to be announced today at Spring Internet World '97.

Information and applications stored in mainframes and Open Database Connectivity-compliant databases can now be pushed to users' desktops as they are updated, when the two companies integrate their product lines by the end of the second quarter, company officials said.

"Push technology to date has been around static published material and notifying users that it's been updated," said Tim Sloane, director of Internet research for Boston-based Aberdeen Group, Inc. "This is the first link that ties the push technology directly back into legacy data and legacy updates, so that online transactions that impact a user can be pushed directly onto that user's desktop."

Simware, based in Ottawa, will retool its Salvo Web application server to work with the Dynamic Publisher server module from Seattle-headquartered Intermind, according to Barry Gander, Simware's director of marketing communications.

Salvo lets companies combine information from multiple data sources and convert it into Web format. Intermind will handle the rest, converting that information to channel files through its Dynamic Publisher. End users subscribe to channels located on the Web site's server and get updates when information changes through the Intermind Communicator client. Pricing has yet to be determined for the integrated product.

Among the slew of other announcements to be made at Internet World:

• Novell, Inc. will unveil an open directory API for Java. This API is expected to make it easier

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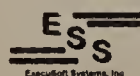## (Then reject that idea, chuckle heartily to yourself and come visit our Web site.)

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Enterprise access

IBM clones routing support in FEP

By Michael Cooney
San Francisco

IBM is getting into the cloning rage.

This week the company will announce it is taking the ATM switching, TCP/IP routing and Advanced Peer-to-Peer Networking handling technology from its new 2216 Multiaccess Router and duplicating it in IBM's 37XX front-end processors (FEP).

The software/hardware package, dubbed Multiaccess Enclosure, will also boost mainframe channel connectivity performance with the inclusion of a new PCI-based, high-speed Enterprise Systems Connection adapter. The adapter supports an enhanced version of IBM's MultiPath Channel (MPC) mainframe communications protocol.

Called MPC+, the enhanced protocol promises to boost APPN/High Performance Routing (HPR) throughput by a factor of three across the channel, resulting in faster access to mainframe resources, said Gilles Garcia, a member of IBM's WAN and server access team in La Gaude, France.

APPN/HPR is IBM's third-generation SNA protocol. In order for users to exploit MPC+, they will need to deploy Version 4.4 of IBM's VTAM mainframe communications flow control

software, which is expected later this year.

"We are building the 37XX family into a multifaceted host access router that can support any kind of IP or SNA connectivity the user can throw at it," Garcia said.

NEW FRONT-END PROCESSOR FEATURES

- An 8-slot, PowerPC-based Multiaccess Enclosure for the 37XX family
- PCI-based adapters for Fast Ethernet, FDDI and ATM connectivity
- PCI-based ESCON adapter for mainframe channel connectivity
- MultiPath Channel+ for high-speed APPN/HPR links to the mainframe
- Improved support for TCP/IP connectivity via a new tn3270E server and Data Link Switching

The Multiaccess Enclosure is an eight-slot box that will bolt directly onto a 37XX rack. It will include support for PCI-based Fast Ethernet, FDDI and ATM adapters, as well as a tn3270E server or Data Link Switching support, which will let users link SNA devices to the mainframe over a TCP/IP backbone. The enclosure can be added to existing FEPs in the field.

One of the key results of this announcement is that IBM will

now have common router and SNA code, as well as adapters that work across its communications family from the 2210 remote branch router to the 2216 and 37XX.

The FEP announcement is part of a larger switch announcement IBM is making this week, featuring a new 12G bit/sec 8260 Super Hub, new Multiprotocol Switching Services code and a variety of other new switching components (*NW*, March 3, page 1).

Server surprise

IBM officials also said their technology duplication efforts will go beyond FEPs. The company plans to embed its router and switching technology in new PC servers that will ship this year. For example, IBM said it would include workgroup Ethernet hubs inside its desktop servers to create packaged workgroup offerings.

There was no word, however, on when those integrated boxes might be available. As for the 2216, the stand-alone model ships this month and is targeted at midsize to large shops looking to merge TCP/IP and SNA networks.

Because it supports ATM LAN Emulation and classic IP over ATM, the 2216 model can also be used as a stepping stone to a campus ATM backbone. ∎

IBM gets BOSSy about object applications

New server beta testing is set for May.

By Christine Burns
Somers, N.Y.

IBM last week revealed plans to ship several object request brokers (ORB) that are aimed at simplifying the development of object-based applications with hooks to back-end business systems.

An ORB is software that automatically establishes links between the distributed objects that make up an application, without the application developer needing to know the exact location of the objects. Through its Business Object Systems Server (BOSS) initiative, IBM will deliver Common Object Request Broker Architecture (CORBA)-compliant ORBs that make it possible to develop distributed applications that can access a variety of databases and transaction processing systems such as IBM's CICS.

The first ORB in this series is scheduled for beta testing in May and will include a set of Object Management Group-sanctioned extended services for transaction processing and system management functions. These extensions allow the ORB to

IBM's Mills says the company is taking big steps to tie object-based applications to legacy systems.

serve as transaction manager, mapping application requests for data or transaction services to the appropriate back-end systems, such as IBM's own CICS, IMS, Encina and DB2 offerings, as well as other vendors' databases.

"With this I can write a transaction without knowing all of the CICS verbs, and BOSS will maintain the transactional integrity between my application on the front end and CICS on the back end," said Steve Mills, general manager of IBM's software division.

This ORB will be generally available sometime in the third quarter as an add-on product for AIX, OS/2 and Windows NT. IBM plans to integrate this technology into its OS/2, AIX, MVS and OS/400 systems in 1998. The NT Server ORB is expected to remain as an add-on product.

Sources close to IBM said future BOSS ORBs will provide hooks to other high-end business applications from companies such as SAP AG and Baan Co. IBM confirmed there would be a series of ORBs but declined to comment on which business applications it is targeting.

Industry observers noted that by simplifying the process of writing object-based applications, IBM could be enabling more widespread adoption of object technology.

"Wrapping those back-end systems so they perform as services on the request broker backbone — without the heavy-duty integration effort the previous generation of ORBs required — is going to push these object applications far beyond the early adopter class of users," said Donald DePalma, an analyst with Aberdeen Group, Inc. in Boston.

The price of this object integration strategy is performance, said Anne Thomas, a senior consultant with Patricia Seybold Group, Inc. in Boston.

"This layer of abstraction makes it easier to use, but if you are concerned about getting the results of those transactions as quickly as possible, that same abstraction slows you down," Thomas said. ∎

Students teach Explorer a lesson

By Todd Wallack

It is time to patch Explorer again.

Just days after Microsoft Corp. acknowledged and patched a security hole in Internet Explorer, three students at Worcester Polytechnic Institute in Massachusetts made national headlines by finding yet another flaw in Versions 3.0 and 3.01.

The latest hole, which drew a large amount of press attention, could potentially give rogue Web site operators access to PCs running Windows 95 or NT. While working on a Web site, the students discovered they could set up Windows shortcut files, which can have .URL and .LNK extensions, as hyperlinks on a Web page — remotely executing the files when users click on the links.

With this method, hackers

could manipulate or delete files. The operator simply needs to know the name and location of a file on the desktop.

"This has got to be a kick in the shins for people who are using Internet Explorer," said Tim Sloane of Aberdeen Group, Inc., a market research firm in Boston.

"You go through the effort of making an evaluation and choosing [Explorer], and now have to go back to every desktop to fix it," he said.

Microsoft said it does not know of any hackers who have exploited the bugs and quickly issued a patch for the .LNK and .URL bug last week.

Still, with some users already jittery about the potential security risks with ActiveX, the latest headlines could potentially tar the browser as unsafe.

And if Explorer users did not have enough headaches, some University of Maryland students uncovered yet another breach late last week. The hole allows malicious Web site operators to embed icons in a page, which can be set to execute files on a PC when double-clicked. But Microsoft said the flaw only affects users running NT outside a firewall. A patch was in the works last week.

Netscape Communications Corp. officials bragged that their

own browsers were unaffected by Microsoft's problems. "One thing to remember is that Microsoft doesn't have as much experience with the Internet as we do," said Eric Greenberg, senior security product manager for Netscape.

But Netscape has had security flaws of its own, Microsoft retorted.

"We're not the only browser that has encountered these issues," said Paul Balle, product manager for Explorer.

John Robb, an analyst at Forrester Research, Inc. in Cambridge, Mass., agreed, saying there should be little long-term impact.

"People are taking all the hype surrounding security flaws and viruses as just that — hype," Robb said.

For the patch, call Microsoft at (800) 322-9997 or download it from www.microsoft.comm/ie/security/download.htm. ∎

NetPC

missing critical management features, and customers are going to need new server software to support the netPC scheme — something Microsoft has said almost nothing about so far.

The draft specification outlines management services, in the form of APIs and software "agents," that will be built into future processors and hardware from Intel, and into upcoming enhancements to Windows NT. These services, in effect, create an intelligent client that can exchange information and follow instructions from remote servers and human administrators.

cludes the hardware profile that was the focus of last fall's original netPC announcement. But now, for the first time, it fleshes out the management features, which are essential for real savings in time and money.

"The key enablers are these management agents for remote manageability of the netPC client," said Jesse Treger, netPC platform marketing manager for Intel in Santa Clara, Calif. "With them, you'll be able to take a netPC product out of the box, plug it in, log on and have it completely configured remotely."

NetPC management will be made possible by three agents: preboot, instrumentation and power management.

NetPC software specification

The draft focuses on a trio of APIs and agents.

- **Preboot agent:** Client device registers with server, which downloads operating system, applications and components, and configures the user's desktop.

- **Power management agent:** Centrally controls and schedules software upgrades, handles license compliance checks, disk optimization and virus scans.

- **Instrumentation agent:** Tracks and monitors client's state, what software and versions it runs, and operational parameters. Management applications will be able to change these.

PCs, or new streamlined net PCs, will incorporate parts of the specification in Intel hardware, and other parts in a future version of Windows NT.

Some 100 industry partners will get the specification in the next two weeks. Their feedback will be incorporated into a final, public document in the next few months. Computer manufacturers will use the document to design, build and assemble netPC devices.

But while users will be able to plug in their newly minted netPCs, they probably will not be able to exploit the most important benefits — the manageability features — until year-end. Intel must implement key parts of the specification in the chip, BIOS, motherboard or network interface card. And Microsoft will add new services to NT Server, as part of the Zero Administration Initiative, in the NT 5.0 release later this year or early next.

But Microsoft has said nothing, so far, about these server-based features or which ones will have priority.

If successful, the netPC program will create a networked client that can be managed more easily and cost less than it does today. And, of course, those clients remain equipped with Intel processors and Microsoft operating systems, unlike those less expensive network computers running Java applets.

The draft specification in-

The preboot agent will let the hardware, when turned on, call to a boot server, which can read the netPC's hardware configuration, check the user profile, and download, install and configure needed software.

The instrumentation agent creates information about the client, such as what software and software versions it runs and its operational parameters.

"Eventually, you can have a remote support center with the ability to both diagnose and fix problems without human intervention," Treger said.

The power management agent handles a wide range of maintenance tasks: installing software upgrades, license compliance checking, disk optimization and virus scans.

Phil Holden, product manager with the Windows product group at Microsoft, said users will not have to wait until NT 5.0 to see benefits with the netPC. By itself, the netPC device will create a simpler desktop environment by preventing users from adding or changing software and hardware on their own.

He also said Microsoft will have "several components" that will take advantage of the netPC with Windows NT 4.0, but he declined to give any details of what, how or when. ∎

Netscape to outline an all-encompassing vision

By Carol Sliwa

Netscape Communications Corp. this week will unveil an agent-based desktop component called Compass, aimed at helping users filter and manage the massive amounts of information flooding their desktops, sources familiar with the plan said. The Mountain View, Calif., software maker also plans to expand its tool offerings, creating a visual development environment for building complex distributed applications that use HTML, JavaScript and Java, sources said.

Mainframes, also, will be a bigger factor in Netscape's long-term strategy. The company plans to tie IBM mainframe data directly into the object repository model it is developing, sources said. Information from those mainframes could then be extracted and pushed to users' desktops.

And those are just a sampling of the concepts to be sprinkled throughout a thick white paper

that Netscape cofounder Marc Andreessen will deliver today to the company's Web site.

Andreessen's paper outlining his vision for the networked enterprise — which he sees as an all-encompassing term for the Internet, intranet and extranet — will deal with Netscape's three main product areas:

- Client, including the new Communicator groupware, a future technology dubbed Constellation, which will let individuals customize their desktops and store the setup on a server for remote access, and the new Compass component.

With Compass, a profile could be set up with searchable key words or concepts. A server-based agent could monitor the changing information and feed it to the client component, sources said. Compass will work in conjunction with Netscape's Catalog server, which organizes and catalogs information stored on the Web server.

"What you're seeing Netscape get into is the information management space, where they'll combine push, pull, agents and catalogs to allow people to better manage and personalize information, because that's one of the things they're missing," one source said.

- Server software that will be enhanced with new capabilities, such as an object store and transaction services, sources said.

- Tools for building object-oriented applications that can be distributed through the Common Object Request Broker Architecture. Netscape currently offers SuiteTools (its own Live-Wire Pro and products from Net-Dynamics, Inc., NetObjects, Inc. and Symantec Corp.) for developing and managing intranet applications, interactive content and Web sites.

"Companies have got mainframes, they've got client/server applications, they've got proprietary stuff sitting around, and they want to link it all up," Netscape's Andrea Cook said about the company's strategy. "That's what we're all about. We're going to try to connect 'em all."

Ⓒ Netscape: (415) 937-2555.

Microsoft tests new NT release

By Christine Burns
Redmond, Wash.

Microsoft Corp. last week announced it is prepping a service pack for Windows NT that lays the groundwork for clustering, message queueing and application sharing, and provides several new security options.

Microsoft will conduct a limited beta test of Service Pack 3 with 300 customers — a service-pack testing first for the company — before making the code generally available sometime next quarter. Jeff Price, a Windows NT Server product manager, said the company is testing the code, in part, to avoid the complications users encountered when they tried to install Service Pack 2, which was released in January. "We want to have better assurance of quality. Testing will be something that we do from now on," Price said.

News of this release so soon after the Service Pack 2 rollout raised user concerns about the quality of Microsoft code and the problem of deploying multiple service packs to distributed machines.

Rick Shope, manager of PC technology and planning at NationsBanc-CRT in Chicago,

said he has no imminent plans to upgrade any of his firm's 1,000 NT workstations or 50 servers to Service Pack 3.

"I question the stability of the code that Microsoft has been shipping since they've moved to this 'Internet time' schedule," Shope said. "We run a 24-by-7 environment here, and I can't afford to risk the downtime that bugs in these service packs can cause."

Angel Cortez, a senior systems engineer with Nordstrom, Inc. in Seattle, said Service Pack 3 does not contain enough new features to go through the headache of rolling it out on his firm's 120 NT Servers — 82 of which are located in remote sites.

Price said that in addition to fixing the numerous bugs that have been discovered since Service Pack 2 shipped, the new functionality slated for Service Pack 3 includes:

- Support for the next release of NetMeeting, Microsoft's end user collaboration product that enables Windows NT workstation users to

share applications over the 'Net.

- Changes to NT's remote procedure call function, which will accommodate the upcoming Microsoft message queuing software, code-named Viper.

- Alterations to the NT spooler and disk subsystem to support Wolfpack clustering software due out this summer.

- Support for the Cryptography API, which provides techniques for encoding both data and messages, and supports digital signatures and certificates, and the National Security Agency's Fortezza PC cards, which provide data integrity, user authentication and encryption. ∎

Servicing Windows NT 4.0

Microsoft last week started beta-testing its third service pack for Windows NT 4.0. Features include:

- ▶ Changes to NT remote procedure call to accommodate upcoming Microsoft message queuing software

- ▶ Support for cryptography API 2.0 and Fortezza encryption cards

- ▶ Spooling and disk subsystem changes for handling upcoming Wolfpack clustering technology

- ▶ Ability to support NetMeeting collaboration software

- ▶ Complete implementation of DirectX technology

- ▶ Support for Open Database Connectivity 3.0 specification

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FORE
SYSTEMS

Tivoli

products run on top of systems that do not have their own run-time version of Java.

On March 25, the company will roll out the first incarnation of TME 10 NetView for OS/390, a mainframe-based management package that will enable users to centrally control and manage ATM devices and IBM PC servers. The product, formerly known as NetView/390, will integrate previously separate net automation packages and other IBM mainframe-based tools into one central management bundle.

Since being acquired by IBM just over a year ago, Tivoli has moved aggressively to absorb IBM's old SystemView manage-ment technology and come out with new, more open and scalable products.

"This move is just an extension of Tivoli's overall thrust into managing applications, whether they be legacy-based, traditional client/server or Java-based in the distributed environment," said Martin Neath, Tivoli's senior vice president of product development. "The goal is to manage anything from anywhere."

That's good news for users looking for a unified set of tools to manage an increasing array of networked systems, said John Bevis, president of Share, Inc. Share last week issued its annual "Top 10 Strategic Concerns" list and enterprisewide systems management was the user group's top issue for the fourth year in a row.

On to Java

By year-end, Tivoli will ship Java front ends to all of its major TME 10 products, which will plug into any Java-enabled browser and allow administrators to tap into management information collected by TME 10 back-end components from anywhere on the network. But analysts expressed concerns about Java's stability in terms of systems management. "Java isn't secure enough yet to be utilized for a lot of system management functions," said Paul Mason, research manager for enterprise systems management at International Data Corp. in Framingham, Mass.

Neath said Tivoli is working to add more security to the framework, namely Secure Sockets Layer support and other Java-based security features currently being developed by Sun Microsystems, Inc.

In the new NetView release, Tivoli is enhancing the MultiSystems Manager (MSM) application so it can gather data from any IBM ATM-based Nways Campus Manager or OS/2 PC server-based NetFinity Manager. MSM gathers topology, configuration, performance and other data needed to manage those environments and places the data in IBM's Resource Object Data Manager (RODM), an object-based management database. MSM today can gather data from SNA, Advanced Peer-to-Peer Networking, TCP/IP and LAN environments.

"Ultimately, the data in RODM we want to make available to all of the distributed TME 10 platforms, and that's where the future Java support and expanded framework will come in," said Richard Szulewski, a member of Tivoli's systems development team. Other legacy systems, such as IBM's Information/Manager, will also be manageable from any distributed TME system. The new NetView package will ship with OS/390 3.0 this summer. ∎

Internet World

for developers using the Java development platform to write directory-enabled applications that leverage Novell's Directory Services.

● Oracle Corp. will announce availability of its Web Application Server 3.0 and showcase third-party developers such as Taxware International, Inc. and Portland Software, Inc. that have developed electronic commerce components for it.

● Aziza, a division of Objectivity, Inc., today will launch a beta of its Enterprise Web Manager software for large intranet sites. The product will let administrators manage security, user access, link integrity and content replication. The final version, due to ship in June, will be priced at $20,000 for 100 users.

● Cambridge, Mass.-based Firefly Network, Inc. will announce it is ready to ship its Webserver tool kit. Administrators can use the kit to personalize content for Web visitors that have Firefly's Passport free cli-

ent software.

● Silicon Graphics, Inc. (SGI) will unveil its WebForce MediaBase 2.0 server, which adds Progressive Networks, Inc.'s RealAudio and RealVideo streaming protocols to SGI's multimedia server for delivering MPEG over IP. "Our database stores metadata about the video content so you can track it and do searches," said Lenny Rosenthal, SGI's WebForce marketing manager. ∎

SGI's WebForce MediaBase *server package lets you keep a searchable database of the content you provide as streaming media to your Internet viewers.*

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1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Resellers of Computer/Network Products (VARs, VADs)
19. ☐ Systems/Network Integrators
20. ☐ Distributors (Computer/Communications)
21. ☐ Other *(please specify)*_____

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:
1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other *(please specify)*_____

3 What is the estimated value of networking equipment and services that you help specify, recommend or approve? (check one only)

01. ☐ $100 million or more
02. ☐ $50 mil. - $99.9 mil.
03. ☐ $25 mil. - $49.9 mil.
04. ☐ $20 mil. - $24.9 mil.
05. ☐ $10 mil. - $19.9 mil.
06. ☐ $5 mil. - $9.9 mil.
07. ☐ $1 mil. - $4.9 mil.
08. ☐ $500,000 - $999,999
09. ☐ $250,000 - $499,999
10. ☐ $100,000 - $249,999
11. ☐ None of the above

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

5 Are you involved in the purchase of and/or plan to purchase network products and services?

☐ Yes   ☐ No

6 Check ALL that apply in Columns A and B:
A. I am involved in the purchase of the following products/services:
B. I plan to purchase the following products/services:

LOCAL-AREA NETWORKS

A	B	
☐	☐	01. Local-Area Networks
☐	☐	02. Network Op. Sys. Software
☐	☐	03. LAN Storage/Backup
☐	☐	04. Optical LAN Storage/Backup
☐	☐	05. Disk LAN Storage/Backup
☐	☐	06. Tape LAN Storage/Backup
☐	☐	07. RAID LAN Storage/Backup
☐	☐	08. Network Test/Diagnostic Tools
☐	☐	09. Cables, Connectors, Baluns
☐	☐	10. UPS
☐	☐	11. Network Interface Cards
☐	☐	12. Peer-to-Peer LANs
☐	☐	13. SNMP Network Management
☐	☐	14. ATM Switches
☐	☐	15. Token-Ring Switches
☐	☐	16. Ethernet Switches
☐	☐	17. Remote LAN Access/Communications Servers
☐	☐	18. Superservers
☐	☐	19. File/Application Servers
☐	☐	20. Print Servers/Fax Servers
☐	☐	21. CD-ROM Servers
☐	☐	22. LAN Servers

INTERNETWORKING

A	B	
☐	☐	23. Bridges
☐	☐	24. Routers
☐	☐	25. Bridge/Router
☐	☐	26. Gateways
☐	☐	27. Intelligent Hubs
☐	☐	28. Stackable Hubs

COMPUTERS/PERIPHERALS

A	B	
☐	☐	29. Laptops/Notebooks/Sub-Notebooks
☐	☐	30. Micros/PCs
☐	☐	31. Minis
☐	☐	32. Mainframes
☐	☐	33. Workstations
☐	☐	34. Terminals
☐	☐	35. Printers/Network Printers
☐	☐	36. Cluster Controllers
☐	☐	37. CD-ROM
☐	☐	38. Fax/Modem Boards

REMOTE/WIRELESS COMPUTING

A	B	
☐	☐	39. PDAs
☐	☐	40. PCMCIA Devices
☐	☐	41. Wireless Data Services
☐	☐	42. Wireless Data Equipment
☐	☐	43. Wireless LANs
☐	☐	44. Cellular Equipment & Services

INTERNET/INTRANET

A	B	
☐	☐	45. Internet Access Service
☐	☐	46. Firewalls/Security
☐	☐	47. Web Servers

INTERNET/INTRANET (cont'd)

A	B	
☐	☐	48. Web Browsers
☐	☐	49. Intranet Applications/Groupware
☐	☐	50. Search Retrieval Products (web crawler)
☐	☐	51. Internet Development Tools
☐	☐	52. Internet Commerce Tools

SOFTWARE/APPLICATIONS

A	B	
☐	☐	53. Network Management
☐	☐	54. Systems Management
☐	☐	55. Security
☐	☐	56. Communications Software
☐	☐	57. Terminal Emulation
☐	☐	58. Word Processing
☐	☐	59. Operating Systems
☐	☐	60. Client/Server Applications Development
☐	☐	61. Database Management/RDBMS
☐	☐	62. Spreadsheet
☐	☐	63. Groupware
☐	☐	64. EDI
☐	☐	65. E-mail
☐	☐	66. Windows/Graphical User Interface
☐	☐	67. Multimedia
☐	☐	68. Graphics/DTP
☐	☐	69. Remote Access
☐	☐	70. Imaging
☐	☐	71. Server Suites (Back office, etc.)
☐	☐	72. Suites
☐	☐	73. Middleware
☐	☐	74. Document Management
☐	☐	75. Database Server
☐	☐	76. Site Metering Tools
☐	☐	77. Computer-Integrated Telephony (CIT)

WIDE-AREA NETWORK EQUIPMENT & SERVICES

A	B	
☐	☐	78. Frame Relay Equip./Services
☐	☐	79. Modems
☐	☐	80. FT-1/T-1/T-3 Multiplexers
☐	☐	81. FT-1/T-1/T-3 Services
☐	☐	82. SONET
☐	☐	83. Inverse Multiplexers
☐	☐	84. SMDS
☐	☐	85. Asynchronous Transfer Mode
☐	☐	86. Diagnostic/Test Equipment
☐	☐	87. DSU/CSU
☐	☐	88. VSAT/Satellite
☐	☐	89. ISDN Equipment & Services
☐	☐	90. PBXs
☐	☐	91. Voice Mail/Response
☐	☐	92. Videoconferencing
☐	☐	93. Leased Lines
☐	☐	94. Switched Data
☐	☐	95. E-mail
☐	☐	96. 800/900/MTS Services
☐	☐	97. Virtual Networks
☐	☐	98. Outsourcing/Systems Integration Services
☐	☐	99. Education/Training Services

☐ 107 ☐ None of the above (1-99)

7 Check ALL that apply in Columns A and B:
A. The following network platforms are currently installed:
B. The following network platforms are planned for purchase:

NETWORK PROTOCOLS

A	B	
☐	☐	01. SNA
☐	☐	02. DECnet
☐	☐	03. TCP/IP
☐	☐	04. Novell IPX/SPX
☐	☐	05. APPC/APPN/LU 6.2
☐	☐	06. NETBIOS
☐	☐	07. AppleTalk
☐	☐	08. NFS
☐	☐	09. IPv6
☐	☐	10. SNMP/SNMPv2
☐	☐	11. Other *(please specify)*

NETWORK OPERATING SYSTEM

A	B	
☐	☐	12. Microsoft (LAN Manager)
☐	☐	13. Novell (NetWare 2.X, 3.X)
☐	☐	14. Novell (NetWare 4.X)
☐	☐	15. Windows NT
☐	☐	16. Windows NT/Advanced Server
☐	☐	17. LocalTalk (AppleTalk)
☐	☐	18. Banyan (VINES)
☐	☐	19. IBM (LAN Server)
☐	☐	20. IBM (PC LAN Program)
☐	☐	21. Artisoft (LANtastic)
☐	☐	22. Digital (Pathworks)
☐	☐	23. Other *(please specify)*

LAN ENVIRONMENT

A	B	
☐	☐	24. 4M Token Ring
☐	☐	25. 16M Token Ring
☐	☐	26. Ethernet
☐	☐	27. Fast Ethernet
☐	☐	28. 100vg Any LAN
☐	☐	29. FDDI
☐	☐	30. LocalTalk
☐	☐	31. 10Base-T
☐	☐	32. ATM
☐	☐	33. Other *(please specify)*

COMPUTER OPERATING SYSTEM

A	B	
☐	☐	34. DOS
☐	☐	35. Unix/Xenix/AIX
☐	☐	36. OS/2
☐	☐	37. OS/2 Warp
☐	☐	38. IBM MVS
☐	☐	39. IBM VM
☐	☐	40. Digital VMS
☐	☐	41. Macintosh
☐	☐	42. Windows
☐	☐	43. Windows 95
☐	☐	44. NT
☐	☐	45. Solaris
☐	☐	46. Other *(please specify)*

☐ 47. ☐ None of the above (1-46)

8 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. INVOLVEMENT (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

9 What is the total number of LANs, workstations/nodes at this location/ in your organization?

At this location:

	LANs	Workstations/Nodes
1.	☐ 5,000+	☐
2.	☐ 1,000 - 4,999	☐
3.	☐ 100 - 999	☐
4.	☐ 50 - 99	☐
5.	☐ 10 - 49	☐
6.	☐ 1 - 9	☐

Entire organization:

	LANs	Workstations/Nodes
1.	☐ 5,000+	☐
2.	☐ 1,000 - 4,999	☐
3.	☐ 100 - 999	☐
4.	☐ 50 - 99	☐
5.	☐ 10 - 49	☐
6.	☐ 1 - 9	☐

10 Please indicate your involvement in developing/implementing Internet/ Intranet Technologies: (check all that apply)

1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ Implement
6. ☐ None

11 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

Mainframes

		A – Installed	B – Planned
1.	IBM	☐	☐
2.	Amdahl	☐	☐
3.	Cray	☐	☐
4.	Hitachi	☐	☐
5.	Unisys	☐	☐

Minis

		C – Installed	D – Planned
1.	IBM	☐	☐
2.	Digital	☐	☐
3.	Tandem	☐	☐
4.	Unisys	☐	☐
5.	AT&T GIS	☐	☐
6.	HP	☐	☐
7.	Data General	☐	☐

What is the total number of Servers/Clients installed/planned: (USE NUMBERS ONLY)

E-AT THIS LOCATION	#	F-% with Internet Access
1. Servers		%
2. Clients		%

G-ENTIRE ORGANIZATION	#	H-% with Internet Access
1. Servers		%
2. Clients		%

Which of the following Servers/Clients do you have installed/planned: (CHECK ALL THAT APPLY)

	At this location:		Entire organization:	
	I-Servers	J-Clients	K-Servers	L-Clients
01. Power PC	☐	☐	☐	☐
02. Power Mac	☐	☐	☐	☐
03. Mac Other	☐	☐	☐	☐
04. Multi Processor Servers	☐	☐	☐	☐
05. P6	☐	☐	☐	☐
06. Pentium Pro	☐	☐	☐	☐
07. Pentium	☐	☐	☐	☐
08. 486	☐	☐	☐	☐
09. 386	☐	☐	☐	☐
10. 286	☐	☐	☐	☐
11. Risc	☐	☐	☐	☐
12. Other	☐	☐	☐	☐

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ $10 billion or more
2. ☐ $1 billion to $9.9 billion
3. ☐ $500 million to $999.9 million
4. ☐ $100 million to $499.9 million
5. ☐ $50 million to $99.9 million
6. ☐ $10 million to $49.9 million
7. ☐ $5 million to $9.9 million
8. ☐ $4.9 million or less
9. ☐ None of the above

13 Estimated number of employees at this location/in entire organization:

At this location:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

Entire organization:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

14 For which areas outside of North America do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

B397

Covering: Network Architectures and Management • Routers • Muxes, Remote
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3Com, USR nuptials blessed by rivals

Cisco, Bay and Shiva say they can thrive on product gaps and customer confusion.

By Jim Duffy and Tim Greene

Competitors are undaunted by the marriage of 3Com Corp. and U.S. Robotics, Inc. and believe they can exploit operations consolidation time, customer uncertainty and gaps in combined offerings.

3Com, the second largest data networking vendor, recently announced it is acquiring U.S. Robotics, a leader in analog modems, for $6.6 billion, which is to date the largest transaction in networking.

LEADERS OF REMOTE ACCESS PACK

1996 worldwide remote access concentrator market

Bay 2%
Shiva 4.9%
Other 5%
Cisco 9.5%
Ascend 34.8%
3Com 7.1%
U.S. Robotics 36.7%

Based on revenue of $1.2 billion
SOURCE: DELL' ORO GROUP, PORTOLA VALLEY, CALIF.

With the acquisition, 3Com is looking to fill out its dial-up remote access offerings at the single-user and service provider ends of the spectrum to better compete against Cisco Systems, Inc. (*NW,* March 3, page 1).

Cisco, though, welcomes the challenge. "By and large, this acquisition brought to the table a large variety of products that in some sense already existed," said Kevin Kennedy, vice president and general manager of Cisco's Access business unit, referring to the overlap between 3Com's Primary Access Corp. products and U.S. Robotics' Total Control hub.

3Com acquired remote access company Primary Access almost two years ago (*NW,* March 27, 1995, page 5). The company's acquisition of U.S. Robotics is proof that the Primary Access deal was a dud, analysts said.

Cisco has an OEM relationship with Microcom, Inc. for modems for its AS5200 access server. Cisco also acquired the digital modem business of Telebit Corp. last summer. Cisco products based on the Telebit technology will emerge this summer, Kennedy said.

Another competitor unfazed by 3Com's new remote access strength is Bay Networks, Inc. Though having significantly less market share in dial-up remote access than U.S. Robotics, Bay offerings are broader and more competitive, said Bruce Sachs, executive vice president of Bay's Internet/telecommunications business unit.

"Essentially, U.S. Robotics is like a one-trick pony into service providers — dial access," Sachs said. "They never established themselves in any other area,"

such as ISDN, frame relay, digital and cable modems, leased-line routing or xDSL.

3Com's distraction in swallowing U.S. Robotics presents Bay with an opportunity, Sachs claimed. "If anything, there will probably be some disarray within the customer base and sales organizations, and that's just fine

with me," Sachs said. "I think where we're positioned, I just assume that they lose the focus."

U.S. Robotics rival Shiva Corp. is also ready to pounce on opportunities opened up by confusion and uncertainty surrounding the merger. Customers will be left worrying which U.S. Robotics gear and which 3Com gear will be dumped when the product lines merge, said Angelo Santinelli, Shiva's worldwide marketing manager.

Also, U.S. Robotics' new x2 56K bit/sec modems could lose the name recognition momentum they gained through extensive advertising, Santinelli said.

Some analysts share this view. "Why [did U.S. Robotics choose to merge] while in the throes of their 56K bit/sec machinations and catching up with Ascend [Communications, Inc.] in market share?" asked Brad Baldwin, director of remote access research at International Data Corp. in Framingham, Mass. "I don't get it. On the U.S. Robotics side, I don't know if this might defocus or derail them." ■

Frame relay

Netrix gets back to basics

By Tim Greene
Herndon, Va.

Netrix Corp. is prepping a high-end enterprise multiprotocol switch as part of its rededication to enterprise networks.

Called the Netrix Exchange 2550, the new switch represents the company's first foray into ATM, featuring a 1.2G bit/sec backplane and a T-3 ATM interface card.

The 2550 also supports Netrix's existing X.25, ISDN, frame relay and time-division multiplexing cards.

While many networking vendors are adding products so they can chase the booming Internet service provider market, Netrix is going the other way.

Last month, it dumped from its product line micro.pop, a dial-up platform for ISPs that included frame relay switching, to focus on the enterprise.

That decision was made after Lynn Chapmann took over as president and chief executive

officer of the company on Jan. 31. He had been vice president of network products.

Focus had become blurred, according to Christopher Nicoll, an analyst at Decisys, Inc. in Sterling, Va.

Carriers off hook

In addition to making a run at ISPs, Netrix had been trying to market its Frame Access Node 2210 to carriers, said Nicoll, who formerly was a business development manager at Netrix.

"[The 2210] was a force-fit for public access. This is an enterprise box," he said.

The company also recognized the need for a higher end switch like the 2550 to complement the 2210.

"The 2210 is running out of steam," acknowledged Glen Hunt, executive director of network

products at Netrix.

Hunt said the 2550 provides users that may be outgrowing the 2M bit/sec 2210 a migration path to higher bandwidth and switching capacity, and to ATM.

In addition, an analog voice interface for the 2210 has been added to allow branch offices fed by analog phones to add calls to the corporate data network.

The Exchange 2550 processor chassis costs about $50,000 and will ship in the second quarter. Prices vary for interface modules.

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CDPD joins cops on the streets

Police department chooses wireless technology to automate reporting process.

By Denise Pappalardo
Guilford, Conn.

With the help of a software company, a service provider and a federal grant of $34,640, the Guilford Police Department is keeping the streets in this Connecticut town safer.

With a police force of 35, the department wanted to increase community patrolling without adding to its staff. It decided to come up with a plan that would allow the officers to file reports from their patrol cars.

The police department needed to find a way to bring its AS/400-based reporting application into the patrol cars with as little pain as possible, said Guilford Police Lieutenant Jeffrey Hocking. The plan also had to include a wireless data service with complete coverage throughout the 46 square miles of Guilford. That turned out to be Southern New England Telephone Co.'s Cellular Digital Packet Data (CDPD) wireless IP services.

Before choosing CDPD, the Guilford Police Department applied for and received licenses in the 800-MHz frequency spectrum. After evaluating the build-out costs, which teetered around $200,000 to $300,000, it became clear the department would have to come up with another solution.

"By choosing CDPD, we put the cost of infrastructure on a private company, and we just pay for usage," Hocking said.

CDPD not only allowed the officers to stay on the streets longer, it also let them access from their patrol cars the state's Computer Aided Dispatch and Records' Management mainframe system for motor vehicle and warrant information, the National Crime Information Center and the National Law Enforcement Telecommunications System.

Meanwhile, Telepartner International, Inc. and Diversified Computer Systems (DCS) designed a reporting system that kept the look and feel of the AS/400. Other software companies required that the police department change its reporting application to suit the wireless protocols they use, Hocking said. Telepartner and DCS let the department basically transfer the application into a wireless environment with little to no change, he added.

"The nine patrol cars are all set up with modems, antennas and five laptop computers that are shared," Hocking said. "By the end of the summer, we plan on having laptops for every car."

Guilford applied for a federal grant that picked up 75% of its cops-on-the-road efforts. "The police department had to show that through its plans, officers would spend more time on the road [to] increase community policing," Hocking said. ■

ISPs form Verio

By James Niccolai
Englewood, Colo.

World-Net Access, Inc. has rechristened itself and joined with 17 local Internet service providers to launch an Internet service network in the U.S. targeted at small and midsize businesses.

Verio, Inc. combines the services and market presence of local ISPs with World-Net's nationwide backbone to offer turnkey packages for electronic commerce and Web hosting, as well as colocation and basic connection services.

The tiered services are available immediately and include basic 56K bit/sec connections to T-1 and T-3 dedicated lines for larger customers. Verio also will target institutions such as hospitals and schools.

The participating ISPs are located in the Pacific Northwest, California, Texas, the Northeast and the Washington, D.C., area, spokesman Steven Silvers said. Verio is in discussions with other local service providers and expects to reach additional areas of the U.S. later this year.

For more information, contact Verio at (303) 645-1900 or via the Web at www.verio.net/.

Niccolai is a reporter for the IDG News Service's Boston bureau.

US WEST offers frame access over dial-up lines

By Tim Greene

US WEST, Inc. last week announced its Dial Access to Frame Relay service, a way for users to outsource remote access and save money on gear at both ends of a remote office connection.

The service lets users call in to the main corporate frame relay network over an analog or ISDN phone line.

Corporate networks can use the service as a way to add sites without buying more frame relay hardware and to let remote users into the network without supporting modem racks at headquarters.

The service is well suited for remote sites that need to connect but do not warrant a dedicated line, according to Steve Taylor, president of Distributed Networking Associates in Greensboro, N.C. "The trade-off is financial. There are many cases where ISDN is considerably less expensive than 56K [bit/sec dedicated frame relay] access to the corporate network," Taylor said.

To use the service, the customer places a PPP call from anywhere using an analog modem or an ISDN terminal adapter. The call hits an Ascend Communications, Inc. MAX TNT dial-up platform, and data is converted to frame relay packets. Those frames are dropped onto Cascade Communications Corp.

Dial your network

US WEST's Dial Access to Frame Relay service:

● Supports frame relay access by remote users with analog modems or ISDN connections.

● Requires no remote dedicated connections or frame relay gear.

● Streamlines headquarters remote access gear.

switches in the frame network backbone of Interprise Networking Services, US WEST's data network division.

The caller is screened by number called, user identification and password and then connected to the corporate network over a frame relay permanent virtual circuit (PVC).

The service is available in Denver, Minneapolis, Phoenix and Seattle. By the end of April, it will be available in six other cities the company declined to name.

The service costs $250 per month per PVC, plus $10 per month for each user. The customer determines how many users to put on each PVC. There is a $300 setup cost per PVC. For frame relay users whose bandwidth needs run into multiple T-1s, US WEST also will introduce a T-3 frame relay service to be available at the end of April.

The offering was designed to streamline the amount of gear a user needs to support wide-area connections when T-1 is the fastest service available, according to Randy Montoya, frame relay product group manager for Interprise.

Pricing will be comparable to the cost of 10 to 14 T-1 frame relay links, which would run about $5,000 per month, Montoya said. ■

WANs & Internetworking Carrier Services

WAN MONITOR

When dbriere@telechoice.com becomes 2077662042

W ith MCI Communications Corp.'s Vault announcement a few weeks ago, the company is anticipating that phone calls will be originating and termi- nating on both the Internet and the pub- lic switched telephone network (PSTN).

Vault represents the integration of Internet telephony gateways into the MCI circuit-switched network.

This raises some serious downstream implications for billing, network manage- ment and customer care systems, as well as for the way we are accustomed to making calls. We brainstormed this issue with Vint Cerf and got some interesting ideas.

A key facet of the MCI architecture is the interconnection of the core logic sup- porting its circuit-switched network with the MCI Internet telephony architecture. So the same rules that govern MCI's vir- tual private network service (Vnet) traffic can govern voice IP traffic in the future. This includes features such as time-of-day routing, account codes, translations and screening, and promises full integration with applications such as call centers.

Will this transform call centers? Con- sider this: A customer accesses a Web- based customer care front end, yet still needs to talk with a rep. A click on an icon launches the call from the desktop.

Call center managers are used to vari- ous billing and net management report- ing features driven by automatic number identification (ANI).

So how do you cap- ture similar data from the Internet to drive these processes and applications?

NetSpeak Corp., the company provid- ing MCI with a lot of its underlying Inter- net gateway technol- ogy, stores some key customer data on the person's computer and in its net-based database server when the customer obtains a telephony ID. This data includes the cus- tomer's E-mail address and phone number, which could be forwarded to the MCI circuit-switched network for billing and reporting.

Daniel Briere and Christine Heckart

Unfortunately, the phone number stored here very likely will have nothing to do with the actual originating ANI. If someone has WebPhone software loaded on a laptop, he could be calling from any- where in the world.

The E-mail address — also stored — might be a more interesting option for longer term use. More demographic information is becoming available keyed to a person's E-mail address. This can be forwarded to the circuit-switched network for incorporation in MIS reporting.

Interestingly, this is where those annoy- ing numerical equivalents come in — numerical E-mail addresses are highly compatible with all the existing circuit- switched billing and information systems.

The IETF should create a database of E-mail address-to-numerical equivalent translations, so as 'Net traffic hits the PSTN, existing PSTN systems can more seamlessly work with that information.

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consult- ancy in Verona, N.J. They can be reached at dbriere@telechoice.co and checkart@telechoice.- com.

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3Com unveils policy-based network software

TranscendWare allows customers to specify classes of service to ensure critical data is delivered first.

By Jodi Cohen
Santa Clara, Calif.

3Com Corp. used to tell customers to just blast bandwidth at performance problems. Now the company is rolling out policy-based network software — in addition to high-speed switches — to help nets run faster and more efficiently.

3Com last week unveiled plans for TranscendWare, a type of software that lets net managers set bandwidth and priority policies for giving end users, departments and applications specific classes of service.

The software, designed for the company's network interface cards (NIC), switches and routers, will ensure critical information is delivered first and that bandwidth-intensive applications such as video get the right quality of service.

"Our NICs will actually have the intelligence to request priorities from the network," said David Tolwinski, vice president and general manager of 3Com's S2 switching division. "The endstation plays a key role here."

3Com's Tolwinski says TranscendWare adds intelligence to NICs.

How it works

Net managers set policies to determine which users and applications should get top priority when congestion slows net performance.

Policy Server software that runs on a PC, switch or other network-attached device houses this information.

When an end user starts a networked application on a PC, 3Com's NIC-based Dynamic Access software interacts with Policy Server to download the policy table to the NIC, which flags the prescribed level of priority on every data packet transmitted by the PC.

3Com's Fast IP core and edge devices, which support IEEE 802.1p and 802.1q, will recognize the levels of priority. Most 3Com LAN gear, including LANplex, CellPlex and ONcore switches, can be upgraded to support Fast IP. When congestion occurs, the switches use Transcend Network Control software to ensure data is passed on according to the predetermined priorities.

To take advantage of TranscendWare, customers will have to add Dynamic Access code to the NICs through a driver update. Tolwinski said the cards will be download-upgradable.

Network managers also will be able to map policies across the WAN. 3Com plans to extend TranscendWare to partner Cascade Communications Corp.'s IP Navigator scheme and to the recently acquired Total Control access server from U.S. Robotics, Tolwinski said.

TranscendWare software will be available as a free upgrade and will be rolled out during the year.
© 3Com: (408) 764-5000.

Novell's plodding turnaround raises industry ire

By Christine Burns
Orem, Utah

Customers, shareholders and other industry observers are growing impatient with Novell, Inc.

The company's repeated claims that it is about to turn itself around are being undercut by continuing bad news bulletins, the latest being disappointing first-quarter financials.

In addition, the company appears to be losing the mindshare battle to Microsoft Corp. and its Windows NT offering, and is still looking to replace Robert Frankenberg, who stepped down as chief executive officer last summer.

"Novell is turning about as quickly as an ocean liner, and that doesn't cut it in this Internet climate," said Paul Strauss, an analyst with Sentry Market Research in Westborough, Mass.

Financial analysts faulted Novell for not meeting conservative Wall Street expectations for first-quarter earnings and revenues, which are 20% and 15%, respectively, below last year's first-quarter numbers.

"They've promised growth for two quarters and haven't delivered. That doesn't inspire confidence in where they are going," said Scott Reamer, an analyst with Cowen and Co. in Boston.

Putting a silver lining on the earnings announcement, President Joe Marengi pointed to record sales of IntranetWare and

said to expect a flurry of activity from the company soon.

At its BrainShare conference later this month, the company will announce enhancements to its Novell Directory Services and ManageWise programs, as well as roll out Novell Border Services for tying intranet services to the 'Net.

Chairman John Young said the uncertainty surrounding Novell's leadership will be cleared up when a CEO is named

in the near future. When Frankenberg left in August, the plan was to fill that spot within four to six months, but that decision is not expected for another few weeks.

Some shareholders are calling for more drastic measures to make the company turnaround happen more quickly.

"We want Marengi and the entire board of directors out of there now," said Joe Antol, a stockholder from New Jersey who has organized other shareholders in a cyberspace protest against Novell management. The group, which calls itself the Novell Investors' Coalition, has pooled more than 500,000 shares to help influence its request for new leadership.

Other industry observers contend that Novell is a likely target for an acquisition.

"With Novell stock so low, if you wanted to take them over, milk the revenue streams and take the $1 billion in liquid cash, now would be the time to do it," said Neil MacDonald, an analyst with Gartner Group, Inc. in Stamford, Conn. ■

NOVELL'S UPS AND DOWNS

In the past 100 days or so on the market, Novell stock has posted a high of $13 on Feb. 28 and a low of 8 3/4 on Oct. 30.

$15					
$12					
$9	Oct. 4 18	Nov. 1 15 29	Dec. 13 20	Jan. 3 17 31	Feb. 14 28
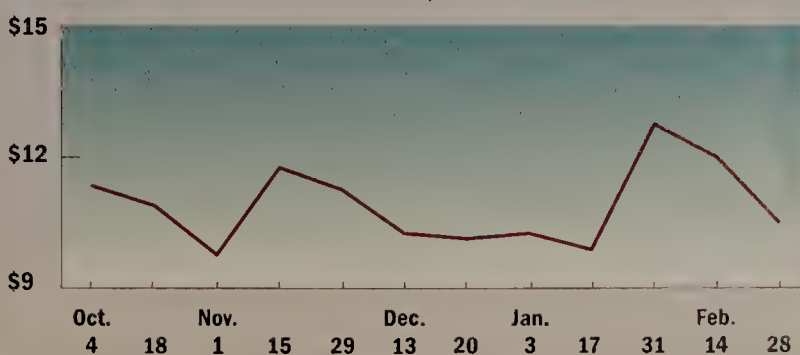
A case of too many irons in the fire

Late software deliveries from Microsoft Corp. are nothing new. But we may be able to read something into the company's latest batch of overdue products and products that have been delivered on time but without originally planned features.

Among the latest late products are Wolfpack Windows NT clustering technology and Windows NT 5.0, formerly known as Cairo.

Wolfpack was announced over a year ago. It's an API to which vendors can write to take advantage of server clustering for better performance and fault tolerance. This first release was supposed to only support failover, which means a second server automatically takes over if a primary server goes down. A later release will allow server clusters to act in concert to load-balance network resources. Originally due late last year, it now appears Wolfpack won't ship until the third quarter or later.

Separately, the ship date for Windows NT 5.0 now appears to have slipped until early 1998. Expect "early" to become "second quarter," unless functionality is removed to meet a ship date.

That's what happened with Windows NT 4.0, which came in almost on time but without the enterprisewide directory scheme that had been touted for it for over a year before it shipped.

Microsoft has shown an enterprise directory prototype, called Active Directory, but it is unclear whether Active Directory as it's now envisioned will ever see the light of day. The problem, according to some who have worked closely with the prototype, is it still clings to the domain concept of NT 3.X and 4.X, which has been shown to be incapable of scaling to the enterprise.

It looks to me as though Microsoft has far too many irons in the fire and can't give them all **Dave Kearns** top priority. Those products that have shipped on time — FrontPage 97, Office 97, Merchant Server — are all part of the Internet/intranet focus that seems to dominate Microsoft's thinking these days.

Before Microsoft goes much further, it would be wise to take a look back at Novell, Inc., which lost its focus a couple of years ago and went on an ill-conceived buying binge.

Novell now appears to be regaining its focus on core network technology and later this month plans to update its plans for clustering and NT integration products at its BrainShare conference in Salt Lake City.

Perhaps it's time for Microsoft CEO Bill Gates and company to decide where Microsoft's future lies, especially regarding its operating systems. Perhaps it's time to drop the network efforts and focus on NT as an application server.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@ msn.com.

Tip of the week

You have the name, or a piece of it — maybe a company, maybe a city or state. So how in the world do you find that person's E-mail address? Enter FerretSoft (www.ferretsoft.com). The company offers six Internet search products including E-Mail Ferret, which searches half a dozen Web-based sources. And, at least for now, it's free.

Client/Server Applications

Covering: Databases • Messaging • Groupware
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Software.com looks to broaden E-mail reach

InterMail 3.0 pitched to large intranets as well as ISPs.

By Paul McNamara
Lexington, Mass.

Having demonstrated an ability to move mountains of messages for large Internet service providers, Software.com, Inc. is currently looking to rock the top of a highly competitive, rapidly expanding corporate intranet market.

The maker of Internet standards-based server software this

A FRAGMENTED MARKET

New business E-mail user seats in 1996:

- Others 20%
- IBM/Lotus 26%
- HP 3%
- Netscape 17%
- Novell 7%
- Microsoft 14%
- Software.com 4%
- Qualcomm 9%

Based on 32 million new users worldwide
SOURCE: IDC, FRAMINGHAM, MASS.

week will unveil InterMail 3.0, a major upgrade to its high-end messaging system that the company claims can serve as many as millions of end users.

In addition, the company announced a deal with network powerhouse Cisco Systems, Inc., which has agreed to take a financial stake in Software.com of less than 5%, jointly develop next-generation directory technology and cross-market products with the messaging vendor.

While analysts and customers concede that Software.com's strength is in the ISP space, opinions are more guarded regarding InterMail 3.0's potential as an intranet rival to products such as Microsoft Corp.'s Exchange and Lotus Development Corp.'s Notes/Domino.

"It's a high-end solution that won't be of interest to everybody," said Joyce Graff, an analyst at Gartner Group, Inc. in Stamford, Conn. "But certainly to the big customers who are trying to build a new 'mainframe,' it's very much of interest, as well as to [ISPs]."
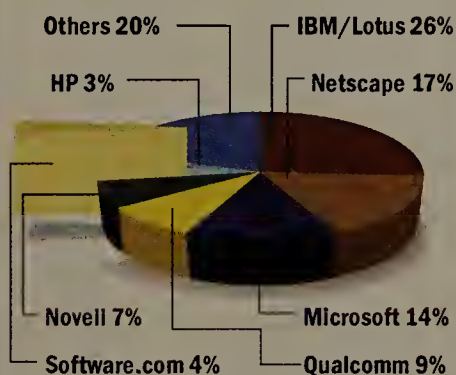
InterMail 3.0, which runs on Sun Microsystems, Inc.'s Solaris and assorted versions of Unix, consists of components that reside on a centrally managed set of servers that work together. The components include a Post Office Protocol 3 client access server, an Internet Message Access Protocol 4 client access server, a Message Store Server, a Message Transport Agent, an Oracle Corp. database and a central administration system. InterMail 3.0 does not include E-mail client software but works with client packages from other sources.

While InterMail 3.0 was designed primarily for ISPs, it provides advanced functionality that networked corporations, such as banks, will come to value more as Internet commerce and intranets expand, said Valdur Koha, president and chief operating officer of Software.com.

Last year, Software.com accounted for 4% of the 32 million new users of business E-mail worldwide with its high-end InterMail and low-end Post Office products. Its newest ISP customer, for one, envisions that share growing among large corporate intranets.

"I don't see any reason why [InterMail] shouldn't be used in any business," said Dennis Spina, CEO at Erol's Internet, Inc., a Springfield, Va., ISP that signed a multiyear, multimillion-dollar InterMail 3.0 licensing agreement. "I don't see anything that would hold them back from selling into [the corporate messaging] market."

Some analysts, however, do see obstacles. Many E-mail buying decisions are still made departmentally rather than enterprisewide, they said, which means geographically distrib-

uted server architectures may prove more popular than centralized server architectures.

On the plus side, Software.com's "tweaking" of an Oracle database to achieve a powerful directory service and its embrace of leading 'Net standards is impressive, said Mark Levitt, an analyst at International Data Corp. in Framingham, Mass.

Currently in beta, InterMail 3.0 is slated for a second-quarter general release. The company declined to release a price list but said prices are based on a per-mailbox model.

© Software.com: (617) 674-0100.

Database add-ons

Oracle improves text search engine

By John Cox
Redwood Shores, Calif.

Oracle Corp. has released a new version of ConText, an Oracle database option that lets users store, manage and analyze text-based data via standard SQL commands and tools.

ConText Option 2.0 now is more tightly linked with Oracle Universal Server, also known as Oracle7, for better performance and easier administration. Other changes include a command that lets users search for documents about a subject, rather than using keywords.

The release also supports Adobe Systems, Inc.'s Acrobat/ PDF document format and indexes, and searches Internet documents by storing URLs in the Oracle database.

First released last July, ConText combines a text retrieval program with a sophisticated linguistic engine that understands the concepts or themes of a text document.

Most databases typically let applications enter text information, such as an explanation of a car accident for an insurance claim or a description of a purchase order via a "comment" field. But once entered, there is no way to easily search and

retrieve the information, said Felix Litman, director of marketing at Oracle's Text Server Division.

ConText works with this type of text information as well as with text stored in external files or on the World-Wide Web. It also handles text stored in various native formats, such as HTML, ASCII, Microsoft Word, WordPerfect and now Acrobat/PDF.

ORACLE'S CONTEXT OPTION 2.0

A text management and analysis tool for Oracle databases, ConText Option 2.0 automatically extracts key themes and theme summaries.

New features:

- Stores URL locations in the database and then searches the contents of a given site.
- Boasts fast performance and easy administration.
- Searches documents about a given subject or theme.
- Reads Acrobat/PDF documents.

With the inclusion of this technology in the Oracle database, developers can use it to build applications that integrate both relational and text information.

Version 2.0 will ship March 12, initially for Solaris. It costs $495 per concurrent user.

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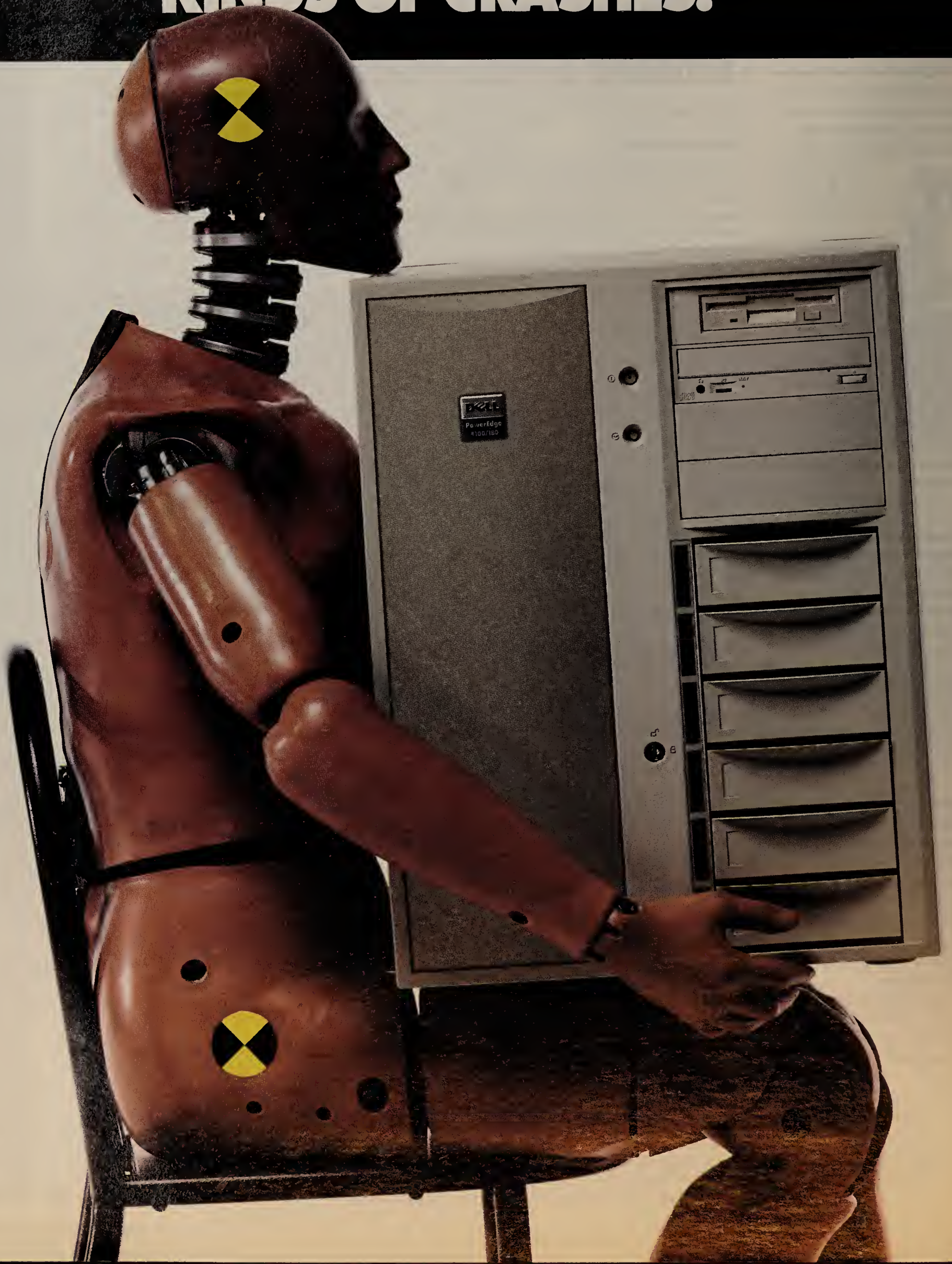
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  -1 Ultra/Wide SCSI for HDD's;
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Special Focus

IBM DATABASES

IBM creates a compelling data management package

By John Cox

IBM has just filled in the one major gap left in its data management strategy with a product that will let customers run complex analytical queries against information stored in IBM DB2 databases.

With the licensing of Arbor Software, Inc.'s online analytical processing (OLAP) software, IBM now offers a complete set of database and data management tools for moving, managing, mining and manipulating data anywhere on a network.

"IBM is absolutely the richest single-vendor source for data management," said Bruce Moxon, a senior consultant at Emergent Corp., a San Mateo, Calif., consulting company that specializes in parallel database solutions. "They also have real strengths in mainframe connectivity, and that's a big issue for people building data warehouses, which pull in data from the mainframes for manipulation."

All this is not to say that IBM can relax. The company must still show that its upcoming release of DB2 Universal Database, due midyear, has successfully merged what are now two separate database offerings: DB2 Common Server and DB2 Parallel Edition.

IBM also needs to add depth and variety to its collection of desktop query, reporting and analysis tools. In addition, the company needs to garner more support for DB2 from third-party tool suppliers.

Filling the OLAP gap

But by licensing Arbor's Essbase OLAP engine, IBM may get some customers to forget about those weaknesses for a while.

Essbase will let users create multidimensional analyses of DB2 data. This means users can ask questions, such as "What will be the effect on net profitability if I cut prices for these products by 10%?," and get answers faster and more easily than with relational databases.

IBM's plan is to build an interface that would let Essbase tap into DB2 databases for data needed to respond to queries. Today, data has to be loaded into Essbase's separate multidimensional data store.

"Given the state of the market for OLAP servers, this could emerge as a very strong product," said Don Depalma, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "They're taking the [Essbase] engine that many other [tool vendors] have written to and moved it to a case-hardened, mission-critical database — DB2."

Part of the plan

The OLAP deal fits neatly into IBM's overall data management product portfolio, which consists of several pieces.

At the center of the portfolio is DB2, IBM's ever-evolving database that now runs on a variety of hardware and software platforms.

Surrounding it are an array of tools that let managers move and manage data across networks and among IBM and non-IBM databases, and funnel data into warehouses that consolidate information for complex queries.

Other key pieces of the product collection are the OLAP server and, at the high-end, special data mining tools that use advanced techniques to predict future behaviors or uncover hidden relationships among the data.

The combined products are convincing industry observers that DB2 is more than an also-ran in the database market.

"DB2 databases still lag behind [those of Oracle Corp. and other database server vendors] in the feature/function race, although IBM is closing ground fast," according to analyst Wayne Eckerson in a December report published by Boston-based Patricia Seybold Group, Inc. and titled "A Comparative Analysis of Data Warehouse Databases." "In some areas [such as object extenders and optimizer technology], IBM is ahead," Eckerson said.

IBM has made big strides with its enterprise data management tools. DataGuide, for instance, creates a visual catalog of special information, called metadata, that guides users in finding the information they need.

Another product, DataJoiner, can pull data from several networked databases to answer a query. DataHub is a tool for centrally administering DB2 and non-IBM databases.

"These are necessary tools for mission-critical applications," said Scott McLeod, database administrator at Diversified Pharmaceutical Services, Inc., a Minneapolis company that processes medical claims for pharmacies and forwards the claim to relevant HMOs. "We don't see the ability to get to a 24-hour, seven-day-a-week processing environment without the ability to replicate our data."

IBM's main challenge now is in marketing, according to Depalma. IBM needs to work harder to enlist the active support of packaged software vendors, systems integrators and value-added resellers for its data management offerings, he said. ■

WHAT'S AHEAD FOR DATA MANAGEMENT FROM IBM

A new release of DB2/MVS with features for building very large data warehouses, and native TCP/IP support.

A merger of DB2 Common Server, with multimedia extenders for handling non-relational data, and DB2 Parallel Edition, which runs on various multiprocessing architectures. This will be released simultaneously on IBM and non-IBM platforms, including Windows NT.

Visual Warehouse, a turnkey solution for building data marts quickly and inexpensively, is being re-architected to handle even the largest data warehouse.

The future of DB2 according to Perna

Q&A Last October, Janet Perna became IBM's "Data Czarina." In so doing, she added the marketing of IBM's data management products to her existing job of overseeing their development.

In effect, she runs one of the world's largest database software companies — 1996 licensing revenue alone totaled $1.5 billion for all products in her group. *Network World* Senior Editor John Cox recently spoke with Perna about IBM's data management strategy.

A key move by IBM has been to port its software, notably DB2, to non-IBM operating systems. What success have you had selling these packages?

The growth in our Unix platform volumes was close to 90% [in 1996, compared to 1995.] For DB2 on NT, [growth was] close to 200%. DB2 Parallel Edition [running on IBM's SP2 Parallel Computer] had growth of close to 100%.

Some analysts say salespeople for Sun Microsystems, Inc. and Hewlett-Packard Co., on whose Unix platforms DB2 now runs, fear DB2 is just a Trojan horse — hiding IBM's real desire to simply sell its own computers. How do you respond to this?

There is a certain amount of paranoia. The thing we need to do is build up the channel of the Sun and HP partners. We also have a direct IBM software sales force selling DB2, regardless of the hardware platform.

The prevailing view is that DB2 on Windows NT lacks the administration tools and ease of use of Microsoft Corp.'s SQL Server. Is IBM doing anything to counter this perception?

If you put DB2 2.0 [which supports object-relational features and other data type extenders] side by side with SQL Server, you'd see SQL Server was easier to use. But with Sybase, Oracle or Informix databases, you'd see a wash. Our benchmark for DB2 ease of use on NT is SQL Server, so we brought in SQL Server administrators to help us improve DB2 for NT. As a result, we've made major enhancements in ease of installation.

What's the role of DB2 in the World-Wide Web?

The Web is really about making content available and providing the capability to transact business. A lot of content today is in databases. Our Net.Data product lets Web browsers access DB2 data. But a lot more content is text, image and other data sitting in files. We want to let customers query and search these nonrelational data types. That's where our object-relational technology fits in.

You can also execute transactions on the Internet: Now you can write DB2 stored procedures in Java. And if you have an application with a Java Database Connectivity interface, which is the Java API, you can access DB2 data through it.

Finally, we want DB2 to be the database that manages Web objects, for example, managing HTML. ■

A key move by IBM has been to port its software, notably DB2, to non-IBM operating systems.

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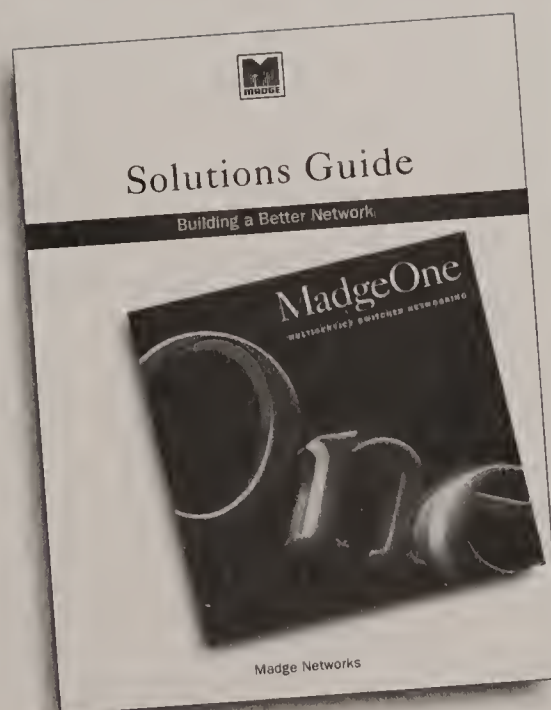MadgeOne™ CD on Multiservice Networking.

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Intranets & the 'Net

New president lends focus to Nets, Inc.

By Chris Nerney
Cambridge, Mass.

Here are Catherine Hapka's top priorities as she begins her job today as president of Nets, Inc.: Focus, focus and focus.

"Focus is the most important thing for a company," said the former US WEST, Inc. executive vice president, tapped last month by Nets, Inc. Chairman Jim Manzi.

And it is something that has been lacking, the company acknowledged several weeks ago when it announced the layoff of about 20% of its workforce and plans to eliminate a Web service for small businesses.

"There were three cultures put together here over the last year, so an early priority is to bring everybody together on the same page," Hapka said.

Manzi, formerly chief executive officer of Lotus Development Corp., took over Pittsburgh-based Industry.net in January 1996. Nets, Inc. was created last July when Industry.net bought AT&T New Media Services.

Nets, Inc. is betting its future on its Industry.net service, a Web-based electronic marketplace that offers product information from 4,500 companies in the manufacturing industry. Industry.net claims more than 200,000 customers have used the service.

According to Hapka, the company is "building an industrial-strength capability for buyers and sellers to take a lot of the costs out of the process of conducting transactions."

Still operating but headed for the scrap heap is Nets, Inc.'s other service, the AT&T Business Network, a Web site for small companies that offers management advice, news and information about handling personal finances.

In a January E-mail to employees, Manzi said the move was designed to better align the company's resources with its core strategy of promoting business-to-business transactions.

Hapka said the layoffs — 54 of 261 employees, most from the Pittsburgh office — reflect the company's efforts to streamline.

"What we're building is an industrial-strength capability for buyers and sellers to take a lot of the costs out of the process of conducting transactions."

Catherine Hapka,
president, Nets, Inc.

"There were certain activities in Pittsburgh that didn't fit the model, paper catalogs and so forth," she said. "Over the last 12 months, I think Jim and the team have gotten crisp about what they do."

The rainmaker

The president's role was formerly filled by Manzi, to whom Hapka will report. She said their working relationship is clear.

"Jim is a rainmaker," Hapka said. "And he is very much a part of the spirit of the place, so he's got an important role to play in the culture and motivation of people.

"But somebody's got to run the day-to-day operations," she said. "Somebody's got to make sure that we understand customer service is crucial and that we're getting the economic model right. I see the split that way." ■

Europe tests key recovery

Microsoft to develop new version of Exchange.

By Ellen Messmer
Brussels, Belgium

The European Commission (EC) is expected to announce shortly a pilot project with five European companies to test modified versions of Microsoft Corp.'s Exchange and Word products that use key-recovery encryption software from Trusted Information Systems, Inc. (TIS).

The TIS data recovery cryptography software will let authorized corporate administrators or law enforcement officials go to data recovery centers to obtain access to data encrypted with Exchange or Word.

German conglomerate Industrieanlagen Betriebsgesellschaft mbH (IABG) will be the prime contractor for the EC's data recovery program. Four other European companies will test the key-recovery versions of the products and operate data recovery centers.

These companies are Bull Enterprise Information Systems in France; R3 Engineering in Switzerland; Philips AG in the Netherlands; and the quasi-governmental company, Defense Research Agency in Malvern, England.

"The goal is to show this will work internationally," said Denis Pinkas, information technology manager at Bull in Les Cloyes, France. According to Pinkas, the EC wants to test the viability of key-escrow and key-recovery encryption techniques.

"At this time, the project is just an experiment," Pinkas said. "We need to understand better how all this will work."

Sources at Microsoft confirmed the company's involvement in the EC project but declined to discuss how it will integrate key recovery into Exchange and Word.

Steve Walker, president of TIS, said one goal of the European pilot is to try to determine what level of interoperability there may between Microsoft products with key-recovery encryption and those without it. ■

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Illusionary advantages

I magine, if you will, that you have two ways to implement an application. With one design, your application appears to the user to be faster than if the second design were used. But the other design reduces the load on the infrastructure it runs over. Which one would you choose?

One way is better for the community but at the cost of having a product that may not seem as good as the competition. In the other scenario, your immediate goal of making the product look better is satisfied, but in the long run, the system overloads may dampen the overall market.

This is the same type of conflict Garrett Hardin explored in his 1968 *Science* article,"The Tragedy of the Commons" (www.csra.net/lrand/GH—TragC.htm— thanks, AltaVista). In the article, Hardin describes a type of problem with no technical solution. Such problems exist when there is a balance of costs and benefits in a course of action.

The benefit of the action is wholly gained by the individual, and the costs are shared by all. This produces an imbalance that makes it hard for the common good to be considered fairly.

This conflict was brought to mind by reports about performance improvements in the new version of the HTTP protocol. HTTP 1.1 defines a process in which a Web client can establish a single, long-lived communications session with a Web server. This is known as a persistent session.

The session lasts until all the individual files that make up a Web page have been transferred from the server to the client. In previous generations of HTTP, separate, short-lived sessions had to be created for each element.

Using the single session, it can take far less time to download the page, and the load on the server and the network infrastructure are considerably less.
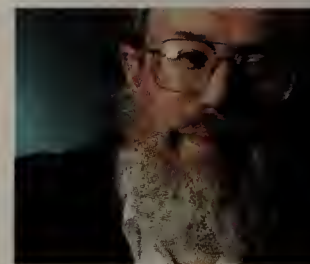
Scott Bradner

But using a single, persistent session may not appear to be faster. Some current browsers open a number of sessions in parallel to retrieve the elements. This can look better because the whole page grows at the same time rather than from top to bottom. This produces an illusion of an advantage. The page takes longer to download but seems to be appearing more quickly.

Examples abound

There are many other examples of this conflict in the networking world. For a number of years, there have been stories that one or another workstation vendor changed the Ethernet back-off algorithm to ensure that their devices could access the Ethernet at a higher priority than other devices on the same net.

This technology was designed with the overall user community in mind. The only solution is for customers to find out what path their vendors have chosen and to insist that any advantages are real for the whole user community, not just an individual.

Disclaimer: While no sheep graze on the Harvard common, which is more for sanitary rather than resource exhaustion reasons, the above meanderings are my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at sob@ harvard.edu.

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Fast LAN SOLUTIONS
Technologies and Applications

Seminar Overview

Today's local data networks are in a period of rapid transition. They are moving from an environment designed to support simple, best effort client/server and remote resource access applications to one that includes for greater traffic. This new class of network-based applications requires high reliability and real-time performance guarantees while at the same time operating under tremendous pressure to minimize cost of ownership.

Fast LAN Solutions: Technologies and Applications, taught by internetworking expert Scott Bradner, will prepare you to successfully manage these new demands on LAN design. This information packed one-day seminar will help you evaluate each of the technologies vying to replace existing Ethernet and token ring networks. Through information-rich case studies the presenter will highlight real-world fast LAN solutions for you to consider in your own LAN design.

Seminar Outline

1. **Introduction**

   Many modern networks are under the twin threats of traffic overload and the impending deployment of real-time applications. Throughout the day we will explore the ways in which fast LAN technologies can be used to overcome these challenges. This section provides an overview of what the seminar includes and an assessment of what particular topics the attendees are most interested in to best meet their learning objectives.

2. **Performance Requirements of Today's Local Area Networks**
   - applications driving network traffic loads
   - the effect of network scale on performance requirements
   - throughput and forwarding rates required in networks
   - how protocols and applications are affected by latency

3. **Quality of Service Implications**
   - the effect of applications on quality of service requirements
   - traditional service quality agreements
   - different types of quality of service controls including ATM and RSVP

4. **Fast LAN Technologies - Options & Issues**
   - switched Ethernet
   - switched token ring
   - Fast Ethernet
   - switched Fast Ethernet
   - Gigabit Ethernet
   - FDDI
   - ATM

5. **Flattening vs. Routing**
   - breaking up broadcast domains
   - using routers as security firewalls
   - manageability implications
   - future routing technologies, e.g. NHRP

6. **Utilizing Virtual LANs in High Performance Networks**
   - VLAN technology in different types of LANs
   - interoperability between VLAN systems
   - VLANs and routing
   - VLANs and server placement
   - VLAN management differences

7. **Sample Network Designs Utilizing Fast LAN Technologies**
   - single building LAN
   - distributed multiple building
   - multiple building using collapsed backbone
   - integration with WANs
   - integration with legacy LANs

8. **Managing Fast LANs**
   - Is network management different for high performance LANs?
   - new management features in high performance LAN products
   - the importance and use of RMON and RMON II
   - the impact of LAN type on network management complexities
   - support of network management by device vendors
   - problems with current network management tools

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Implementing FRAME RELAY
Strategies & Solutions

Directed by: Thomas Jenkins

Seminar Overview

Frame relay has become the fastest growing data service in the industry and is only matched by the growth rate of the Internet. **Implementing Frame Relay: Strategies and Solutions** will help you decide whether frame relay is the right service for your company and you will learn what benefits you can expect from implementing a frame relay network. In addition, this seminar, taught by Tom Jenkins of TeleChoice, Inc., a frame relay expert, will explore which applications perform well on a frame relay network and which carriers you need to consider in your evaluation process.

Even if you have already implemented a frame relay network, attending this information packed one-day seminar will teach you the new features and services available in the market and how they can benefit your company.

Seminar Outline

1. **Deciding to Use Frame Relay Services**
   - Business requirements
   - Typical Applications
   - Advantages of using frame relay
     - Network performance
     - Cost
     - Network management
     - Flexibility
     - Productivity
   - Disadvantages of using frame relay
     - Single provider
     - Conversion costs

CASE STUDY: This case study will show how a multi-point private line network can be transitioned to frame relay.

2. **Understanding the industry jargon**
   - Frame relay "standards"
   - What a frame is made of
   - Oversubscription   · Bursting
   - FECN/BECN   · Discard eligible
   - Difference between cell and frame relay
   - Routing protocols
   - Protocol performance over frame relay

3. **Service Provider Network Infrastructure**
   - Effects of switch locations
   - Backbone speed   · Redundancy
   - Network platform(s)
   - Network transport

CASE STUDY - This case study will show how a typical "dual star" configuration can be supported by frame relay.

4. **Customer Network Components**
   - Nodes
   - Tail circuits(option for access)
     - UNI   - NNI
     - Dial-up   - ISDN
   - Ports - Role of the port
   - PVCs, SVCs and VC
   - CIR
   - CPE: Router/FRAD

5. **Designing and Ordering Your Frame Relay Network**
   - Determine your objectives
   - Gather site information
     - Traffic   - Equipment
     - Protocols   - Applications
   - Draw network topology
   - Submit a RFP
   - How to negotiate a contract
   - Transitioning your service to frame relay
     - Common equipment issues
     - Installation intervals
     - A recommended transitioning strategy

CASE STUDY: Frame relay is used to consolidate LAN and SNA traffic onto a single network. We will discuss the CPE considerations and the benefits to using frame relay for this type of network.

6. **Value Added Services**
   - Managed network services
   - Native LAN services
   - Voice over frame relay
   - Frame access to Intranets/Internet

7. **Key differences between the U.S. service providers**
   - Platform
   - Value added services
   - Access options
   - Pricing structure
   - Service guarantees

8. **Future growth of Frame Relay services and your network**
   - Migration path to ATM
   - SVCs
   - Sources for additional services
   - Effects of deregulation of frame relay service
   - Network growth internationally

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IPv6

THE NEXT GENERATION FOR TCP/IP INTERNETWORKS
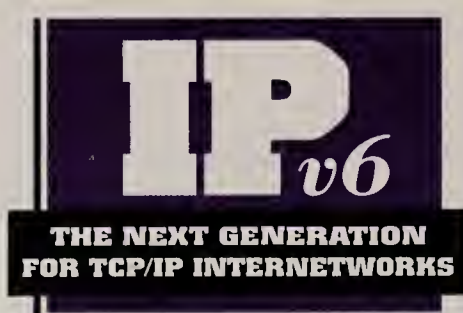
Directed by: Mark Miller

Seminar Overview

The next generation of Internet Protocol - IPv6 will significantly impact your TCP/IP network. The Internet explosion now requires new functions that go beyond the capabilities of the current Internet Protocol, or IP. These include enhanced security, support for real time traffic flows and expanded addressing capabilities.

Whether you are a network manager, designer or software developer, this seminar will provide you with information on the widespread ramifications of this new protocol. You will learn how to effectively plan and implement a successful, orderly transition.

Seminar Outline

1. **Defining a new Internet Protocol**
   - The explosive growth of the Internet
   - Depleting the IP address space
   - Technical limitations of IPv4
   - The IETF Response - IPng
   - Proposed solutions:
     - CATNIP - Common Architecture for the Internet
     - TUBA - TCP/UDP over CLNP-Addressed Networks
     - SIPP -Simple Internet Protocol Plus
   - The final result: IP Version 6
   - Testing IPv6- the 6Bone network

2. **The IPv6 Specification**
   - The Benchmark - Operation of IPv4
   - The IPv6 Specification
   - The IPv6 Header
   - The IPv6 Header Format
   - Comparing IPv6 with IPv4
   - Next Header Field Operation
   - Optional Extension Headers
   - Packet Size Issues

3. **Addressing Architecture**
   - The Benchmark - IPv4 Addresses
   - Classless Interdomain Routing (CIDR)
   - Address Options
   - Addressing Architecture
   - Unicast Addresses: Subnet, IEEE 802, Hierarchical, Provider-based
   - Transition Addresses: IPv4 to/from IPv6
   - Anycast and Multicast Addresses
   - Required Addresses for Nodes

4. **Intranetwork Communications**
   - The Benchmark - ICMP for IPv4
   - ICMPv6 Enhancements
   - ICMPv6 Message Formats
   - Error Messages
   - Informational Messages
   - Group Membership Messages
   - The Neighbor Discovery Protocol
   - Neighbor Discovery Message Formats
   - Router Solicitation/Advertisement Messages
   - Neighbor Solicitation/Advertisement Messages
   - Redirect Messages
   - Neighbor Discovery Message Options

5. **Autoconfiguration and Local Area Network Effects**
   - Address Autoconfiguration
   - Neighbor Discovery, Revisited
   - The Autoconfiguration Process
   - IPv6 over Ethernet and Token Ring
   - IPv6 over FDDI
   - IPv6 over WANs

6. **Effects on the Routing Process**
   - IDRP for IPv4 and IPv6
   - RIPng for IPv6
   - OSPF for IPv6

7. **Effects on the Upper Layers**
   - Upper-layer Checksums
   - Maximum Packet Lifetime
   - Maximum Payload Size
   - Domain Name System Updates
   - BSD APIs

8. **Security Architecture**
   - Security Architecture
   - Authentication
   - Encryption
     - Encrypted Packet
     - Tunnel-mode ESP
     - Transport-mode ESP

9. **The Transition - Moving from IPv4 to IPv6**
   - Transition Process
   - Transition Addresses
   - Dual IP Stacks
   - Tunneling

10. **Vendor solutions and implementation plans**
    - Vendor implementation of IPV6 within their products.

11. **References for further study**

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pg. 4

Enterprise Network Management
Understanding SNMP, SNMPv2 and RMON

Directed by: Mark Miller

Seminar Overview

With the explosive growth of enterprise internetworks, the need for integrated network management systems to help simplify management operations has never been greater. SNMP (Simple Network Management Protocol) has become the de facto standard for end-to-end enterprise network management.

This one day, information-packed seminar taught by internetworking expert, Mark Miller, will help you understand the elements of an SNMP-based network management system and how to implement SNMP with your internetwork. You will learn about recent enhancements to the Remote Monitoring (RMON) network management architecture, known as RMON2, and the advantages of implementing RMON throughout your internetwork.

Seminar Outline

1. Understanding Internetwork Management
- Defining the System Being Managed
- Elements of a Network Management System
- The Agent/Manager Model
- OSI Network Management and the Five Specific Management functional areas
- The IEEE Model for LAN/MAN Management
- The Distributed Management Task Force (DMTF) Model
- The Internet Model: the SMI, MIB and SNMP
- The Next Generation: Web-based Enterprise Management (WBEM)

2. Network Management Implementations
- Asante Technologies' IntraSpection
- Cabletron Systems' SPECTRUM
- Hewlett Packard's OpenView
- Tivoli TME 10 Netview
- Novell NetWare Management System
- SunSoft's SunNet Manager

3. The Structure of Management Information
- Key elements of Abstract Syntax Notation One (ASN.1): data types, values, modules and macros
- Transmitting management information - the Basic Encoding Rules
- Examples of Type-Length-Value Encoding
- Understanding Object Identifiers (OIDs) and their position on the OID tree

4. Management Information Bases
- Groups and Objects in MIB-II, RFC 1213
- MIBs for internetworking devices: Hosts, Bridges, etc.
- MIB support for WANs
- The Remote Monitoring (RMON) MIBs for Ethernet and token ring LANs
- RMON vs. RMON2 - key enhancements and upgrades
- Private Enterprise MIBs
- Using a MIB complier to incorporate multiple vendor's MIBs into the Network Management System
- Case Studies: Browsing the System subtree of the Internet-standard MIB

5. MIBs for Broadband Networks
- Comparing service management and device management
- Customer Network Management
- The DSI/EI MIB
- The DS3/E3 MIB
- The SONET/SDH MIB
- The Frame Relay MIBs
- The SMDS Interface Protocol MIB
- The ATM MIB

6. Simple Network Management Protocol
- SNMP objectives and operation
- Object instances
- The Get, GetNext, Set, GetResponse and Trap Protocol Data Units (PDUs)
- Using the SNMP PDUs
- Case Studies: Comparing the Get and GetNext PDUs

7. Enhancements with SNMP Version 2
- SNMPv2 SMI: Data Types and Macros
- Textual Conventions
- The SNMPv2 MIB: New MIB Modules
- New Protocol Operations: The GetBulk, InformRequest and SNMPv2-Trap PDUs
- Improved Error Processing
- Support for AppleTalk DDP, Novell IPX and ISO transport protocols
- Security alternatives: SNMPv2u and SNMPv2*
- Co-existence of SNMPv1 and SNMPv2

8. Underlying Transport Protocols
- User Datagram Protocol (UDP)
- Internet Protocol (IP)
- Address Resolution Protocol (ARP)
- Local Network Protocols (Ethernet, token ring, FDDI, etc.)
- Case Studies: Looking at the UDP and IP header formats

9. Implementing SNMP - Case Studies from Real Networks
- Access control using the Community Name and IP address
- Using Traps to signal network events
- Confirming Trap Communication
- Incompatible Private Enterprise MIBs
- Configuring remote internetworking devices with SNMP

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INTERNETWORK
Design and Analysis

Seminar Overview

Fost Ethernet, ATM, frome relay and SMDS are delivering more efficient ond ever-foster communications across enterprise networks. This 3-day seminar will teach you how to design, implement, onolyze and manage multiprotocol, multi-operating system internetworks thot seomlessly integrate legacy and emerging technolagies. Throughout this class, we will moke extensive use of network madeling, simulation ond analysis tools ta demonstrote the techniques that are presented in this seminor.

Seminar Outline

1. **Internetworking Principles and Standards**
   - Open Systems Interconnection Principles
   - OSI Protocols for Internetworking
   - Applying Connectivity Devices to the OSI Model: Repeaters, Bridges, Switches, Routers and Gateways
   - IEEE Project 802
   - LAN Frame Formats: Ethernet, IEEE 802.3, IEEE 802.5
   - IEEE Bridging Standards: Transparent Bridging, Source Routing and Source Routing Transparent Bridging
   - Case Study 1: Ethernet Fragments
   - Case Study 2: Token Ring Initialization
   - Case Study 3: FDDI Station Mgmt.

2. **LAN-to-LAN Internetworking**
   - Designing the LAN-to-LAN Connection: Repeating, Bridging, Switching, or Routing?
   - Network Analysis: The impact of traffic on delay/throughput
   - Connecting Dissimilar LANs

3. **Analog and Digital Data Transmission Facilities for Internetworks**
   - Analog Line Facilities - transmission parameters and conditioning
   - Digital Lines - North American Digital Transmission Hierarchy and framing formats including Fractional T-1
   - Packet Switched Public Data Networks
   - Integrated Services Digital Networks
   - Remote Access to Internetworks

4. **X.25 Protocols**
   - Packet Switched Public Data Networks
   - X.25 Related Protocols
   - Interfaces to WANs: X.31, X.32 and X.75
   - X.25 Internetworking Examples

5. **Broadband Networking**
   - Broadband Networks and OSI
   - Broadband Transmission Rates & Network Economics
   - Frame Relay: Standards, the User-Network Interface, frame format, congestion control and Internetworking
   - SMDS: Standards, the Subscriber-Network Interface, the SMDS Interface Protocol, PDU formats and Internetworking.
   - ATM: Standards, Interfaces, Virtual Connections and Internetworking
   - Broadband Internetworking Examples

6. **LAN-to-WAN Internetworking**
   - Designing the LAN-WAN Connection: Leased line, Frame Relay, SMDS and ATM Network Configurations
   - Network-specific design issues
   - Case Study 4: Using software tools for network optimization: predicting message transfer delays, protocol overhead, response times and network performance.

7. **TCP/IP and the Internet Protocols**
   - The ARPA Protocol Suite
   - ARPA Network Interface Layer Alternatives: Ethernet, IEEE 802, ARCNET, FDDI & Broadband Networks
   - The ARPA Internet Layer: IP Router Operation, the Internet Protocol (IP) Header, Addresses, and Routing Protocols
   - ARPA Host-to-Host Layer Protocols: Transmission Control Protocol (TCP), and the User Datagram Protocol (UDP)
   - ARPA Higher Layer Protocols
   - The Next Generation for TCP/IP Internetworks: IPv6
   - TCP/IP Internetworking Examples
   - Case Study 5: Diagnosing incompatible terminal types

8. **XNS Protocols**
   This section will look at the architecture of the Xerox Network Systems (XNS) protocol suite, which is the cornerstone of many other architectures.

9. **Networking Software, Internetworking, and Interoperability**
   - Apple Computer AppleTalk
   - Banyan VINES
   - Novell NetWare 3 and 4
   - Microsoft Windows NT
   - IBM OS/2 LAN Server
   - Case Study 6: Booting AppleTalk stations on a token ring network
   - Case Study 7: VINES internetwork initialization
   - Case Study 8: The Token Ring route discovery process
   - Case Study 9: Using NetWare with source routing bridges

10. **Gateways**
    - BLAST Software
    - Beame & Whiteside
    - Innosoft International
    - Shiva   · Andrew
    - Miramar Systems   · Hewlett-Packard
    - Attachmate   · FEL Computing
    - InterConnections
    - Data Interface Systems · Micro-Integration

11. **Implementing the Internetwork**
    - Project concepts: budget, system requirements and architecture
    - The design process
    - Installation and testing
    - System cutover and acceptance
    - On-going support procedures

12. **Managing the Internetwork**
    - The Specific Management Functional Areas
    - Network management using SNMP
    - Remote Monitoring (RMON)
    - Case Study 10: remote router configuration and management
    - Case Study 11: private enterprise MIBs
    - Case Study 12: implementing RMON

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Essentials of Networking and Data Communications

Technologies and Their Practical Application

Seminar Overview

Essentials of Networking and **Data Communications** is o dynomic, fost-poced, ploin-English, common-sense ond thoroughly understondoble explonotion of current ond developing network technologies ond communicotions systems. Acronyms ore decoded, technologies ore de-mystified, stondords ore put in perspective, ond regulotory issues ond trends ore exploined. The present ond future "Networked World" is set in the context of meoningful ond cost-effective business opplicotions.

Seminar Outline

1. INTRODUCTION
- Date Communications Overview
- Voice, Data, Video and Image–It's ALL Data
- Bandwidth, and the Applications which Consume It
- Broadband Networking as the Solution
- Computers and Communications Come Together
- The Information Superhighway, Real Products or Empty Promises?

2. TECHNOLOGY BASICS
- Transmission Fundamentals
- Links, Circuits, Trunks & Lines
- 2-Wire, 4-Wire Circuits
- Bandwidth
- Analog vs. Digital Transmission
- Multiplexing
- Virtual Circuits
- Switching Basics
- Signaling System #7 (SS7)

3. TRANSMISSION BASICS
- Twisted Pair
- Coaxial Cable
- Microwave
- Satellite
- Infrared
- Fiber Optics

4. DATA COMMUNICATIONS BASICS
- CPE/DTE DCE
- Modems
- DSUs/CSUs
- FEPs
- Protocol Basics
- Line Setup/Connectivity
- Simplex, Half Duplex, Full Duplex
- Baudot, ASCII, EBCDIC & Unicode
- Asynchronous vs. Synchronous
- Bit Sum, VRC & LRC, & CRC
- Examples–Async, Bisync & SDLC
- Security
- Protocol Stacks & Suites
- OSI Reference Model
- TCP/IP

5. CONVENTIONAL DATA NETWORKS
- Evolution of Data Networking
- DDS
- Switched 56/64
- T/E-Carrier
- ISDN
- Case Study

6. LAN FUNDAMENTALS
- LAN Standards and Standards Bodies
- Media Types
- Physical and Logical Configurations
- Broadband vs. Baseband LANs
- Specific LAN Standards
- Ethernet
- Token Ring
- FDDI
- Case Study

7. LAN INTERNETWORKING
- Lan Building Blocks
- Bridges
- Routers
- Hubs
- Switches
- LAN Internetworking
- Remote LAN Access
- High-Speed LANs
- FDDI
- Fast Ethernet
- 100VG-AnyLAN
- ATM
- Virtual LANs
- Case Study

8. BROADBAND NETWORK INFRASTRUCTURE
- Emerging Local Loop Technologies
- ADSL
- HDSL
- MDSL
- Access Methods
- Sonet/SPH
- Add/Drop Multiplexing

9. BROADBAND SERVICES AND ACCESS
- Frame Relay–An Access Standard
- SMDS–Cell Relay in the MAN
- ATM–The Ultimate Service Standard
- Broadband Internetworking
- Frame Relay-to-ATM
- SMDS - to-ATM
- B-ISDN
- AINs
- Case Study

10. WIRELESS DATA NETWORKING
- Frequency Re-Use
- Access Techniques
- CDPD
- Packet Data Networks
- Wireless LANs and Loops
- LEOs & MEOs

11. THE INTERNET, THE WEB AND CONVERGENCE
- Circuits, Packets, Frames & Cells
- Access Techniques
- Applications
- Bandwidth
- Security
- Intranets

12. NETWORK CONVERGENCE
- Driving Forces
- Defining New Services
- Terminals, Networks & Applications
- Telco/Computer/CATV Convergence
- PCS, CATV, Power Utilities, Internet

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We are experiencing virus problems in our network, even though we're running antivirus software. We've installed McAfee's NetShield Version 2.3.2 on our servers and Net-Shield for Windows Version 2.5.3 on all our workstations. We are having problems with viruses attached in E-mail, for which we use Lotus Development Corp.'s cc:Mail Release 2.21. We are thinking about getting Scanmail to check attachment files, but does McAfee have a similar program?

Von Dacudao, Dole Asia Ltd., Philippines

Try adding McAfee's WebScan software. This utility was designed to prevent Internet users from downloading virus-infected files and E-mail.

It can detect traditional virus types as well as macro viruses, such as Winword.concept, that can hide within Internet E-mail attachments.

Depending on the severity of your problem, you also might consider another McAfee product called Rom-Shield. It is a chip that plugs in to selected network cards to protect them from viruses during boot-up.

It seems you have a good start on protecting your network from viruses, but make sure you get the latest virus signature updates for your system as soon as McAfee releases them.

It also is worth checking the DOS partitions on your server after you set them up and before you move them into production. In addition, it is a good idea to check the DOS partitions if anyone works on a server, particularly if the server is taken down to install updated drivers.

Although DOS is in a suspended state when NetWare is running, damage can occur when the server is taken down to DOS. Be sure you have at least one good backup of the server before doing this. It is possible that you could loose the NetWare partition on the drive by cleaning the virus in the DOS partition.

'My calendar will call your calendar'

The Internet Mail Consortium's vCalendar standard makes disparate scheduling programs compatible.

By Paul Hoffman

A truism of many computer users is that they find software they like and start using it without much thought of cross-vendor compatibility. It's not until they want to share the data generated in the program with someone using a different product that they start thinking about that issue.

Consider the datebook portion of most personal information manager (PIM) software. Users can easily enter dates and times, even repeating events, using their own software. But wouldn't it be useful if they could give that information to someone running a different brand of software so schedules could be coordinated?

Formats for events

The vCalendar format, designed by the versit Consortium and currently maintained by the Internet Mail Consortium (IMC), provides this capability. vCalendar specifies how events should be described so any vCalendar-aware program can read them.

Major players such as Lotus Development Corp. already are using vCalendar in their software, and dozens of other companies are expected to do so this year.

A vCalendar object describes one or more date-related objects. These objects can be activities that are a scheduled amount of time on a calendar (meeting with Chris in Atlanta from 3 to 5 p.m., May 12), or an action item or assignment that is not specifically scheduled (call Chris this week to confirm our meeting). The date-related objects in a vCalendar object can relate to each other.

As you can imagine, these types of descriptions are exactly what most personal and group schedule management software use all the time.

It also is the kind of data used by calendar coordination software, which tries to find the best time for a group of people to meet after checking on everyone's schedules.

Many software developers also are using the vCalendar format so their products will be able to interoperate in the future. For example, Oblix, Inc. uses vCalendar as the internal calendar format for its IntraPower Suite in anticipation of when it will be able to exchange calendar objects with software from other vendors.

It is important to note that vCalendar specifies only the format for the data, not how the calendar data is transferred among computers. vCalendar-compatible software might pass data through E-mail, over the World-Wide Web or over infrared links on a portable computer, for example.

The vCalendar specification simply describes how each calendar item will look so the receiving program will know exactly which part is the start time, the duration, the resource being scheduled and so on.

What's in an event?

vCalendar was designed to be flexible so software companies can add specific information to their calendaring programs while still making them interoperable with one another. The core set of vCalendar properties includes advanced features such as attachments (for example, a report that is going to be discussed in the meeting that the event is describing), geographic position, audio and E-mail reminders, and classification of events.

The core specification also has many properties that relate to scheduling oddities. For example, a recurring event (every Tuesday from 9 to 11 a.m.) can have an exception rule associated with it (except for the last Tuesday of the month for the next three months). This allows current PIM software to more effectively coordinate group calendars than previous generations.

vCalendar objects also can contain electronic business cards, called vCards. This means,

for example, if you are trying to schedule a meeting with someone you haven't met, you can attach your vCard to the scheduling event so the recipient can easily contact you.

The vCard specification was also developed by the versit Consortium and is now managed by the IMC.

In addition, software that uses the vCalendar format can have proprietary extensions, although these will not be useful to people using other brands of software. For instance, if your calendaring software is part of your videoconferencing system, it might use a proprietary extension to start the videoconference as part of the execution of an event.

vCalendar on the move

The current version of the vCalendar spec is getting wide attention, and work on the next version is already under way.

The Internet Engineering Task Force's calendaring is writing the iCalendar specification, which will turn into vCalendar Version 2.

The working group also is considering standards for transporting calendar objects. Still, many companies are implementing Version 1 of the standard because of its completeness and wide support.

Information on vCalendar future work is available from the IMC at www.imc.org/pdi/.

Hoffman is the director of the IMC, an industry group in San Jose, Calif. He can be reached by phone at (408) 426-9827 or via the Internet at phoffman @imc.org.

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vCALENDAR OVERVIEW

Goal
To provide interoperability among electronic messaging services, calendaring and scheduling applications.

Target applications
Group scheduling applications, enterprise calendaring applications, Internet calendar publishing services.

Intended use
For exchanging information about events and to-do types of calendaring and scheduling entities, with an event being a scheduled amount of time on a calendar and a to-do being an action item or assignment.

Standards compliance
References the XAPIA Calendaring and Scheduling API for capabilities; uses the ISO 8601 standard to represent dates and times; identifies languages and character sets through ISO and IETF standards; uses syntax based on the grammar defined by the Internet SMTP and MIME E-mail standards.

Vendor support
Attachmate, Hewlett-Packard, IBM, Lotus, Lucent Technologies, Microsoft, Netscape, Novell, Oracle and others.

Implementation considerations
The full potential can be better reached when an application supports the specification through the file system, clipboard and drag-and-drop user interfaces.

SOURCE: IMC, SAN JOSE, CALIF.

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Are you missing a big opportunity?

When I talk to people about intranets, I often run into someone who smiles knowingly and says: "Oh, intranets are fine for document publishing, but they're not designed for 'real' applications — you know, big, brawny transaction apps that run the business."

That's distressing because it's wrong on two counts. One, people are already building real applications on intranets. In a study we recently completed, 55% of the companies with intranets said they are using them as a platform for new collaborative computing applications, and a quarter of the companies claimed to be using intranets for transaction-oriented applications and electronic commerce.

Second, intranets aren't just about building new applications — they're a way to open up existing applications to new users and new uses. You can give end users in your company, as well as customers and suppliers, access to back-end systems and make their lives, and yours, easier. That was too hard to do in the client/server world, where you had too many host, network and desktop variables to contend with.

FedEx's Web-based package-tracking system and Charles Schwab's Web-trading tool are great examples of the concept at work here (both are Internet rather than intranet applications, but the idea's the same). Schwab is bringing that same approach to its intranet by Java-enabling traditional applications.

Irving Wladawsky Berger, who heads up IBM's Internet Division, summed up the beauty of Webifying back-end systems with unusual candor: "Client/server focused on replacing the bastards in the glass house. It's better to leverage the bastards for the good things they have. The Web is pragmatic that way."

Those good things are business-oriented applications built to handle transactions, security and commerce. The Web offers a new way to use them and all that data.

Of course, if you're going to do this, you have to make sure it works. American Airlines lets you get fare info from its Web site, but when I tried to quote prices for a trip from Boston to Chicago, I got an error message for hours saying the back-end system was busy. Application problems irritate users, and the Web — internal or external — can irritate people on a grand scale.

All this leads to my big question: Are you ignoring perhaps the juiciest part of the intranet opportunity? Have you thought about which of your applications you could open up to other departments, remote users or business partners? You don't have to open them to the world via the Internet — you can do it more privately and securely via your intranet. But you should do it. It may be the most important and profitable aspect of the whole 'Net opportunity.

John Gallant, editor in chief　　　　　　jgallant@nww.com

Telecom Regulation • Susan Bahr

Wanted: Advice on how to data-enable the public net

The Federal Communications Commission is giving users the opportunity to participate in designing the public network of the future. In response to an inquiry launched late last year, the FCC is looking for your feedback on whether and how the telephone network should be changed to support increased data traffic.

Although the FCC's focus is on use of the Internet, non-Internet enhanced services could be affected, including credit card verification, broadcast fax, E-mail, electronic document and data interchange, voice mail, protocol conversion and interactive voice response services that provide news and weather. If your company provides or uses any enhanced services, now's the time to give the FCC your two cents.

The main participants in the debate about handling increased data traffic on the telephone network are the local telephone companies and Internet service providers. Some local telephone companies claim their networks are congested by Internet calls — which last between 20 and 40 minutes, compared with between 5 and 10 minutes for voice calls. Both types of calls tie up a network circuit for the duration of the call, although a dedicated circuit may not be necessary for bursty data traffic.

In addition, some local telephone companies contend they are not recovering their costs of supporting data traffic. However, ISPs argue that they and their customers acquire more lines and request additional telephone services, thereby generating revenues for the telephone companies.

The first round of this debate began last month. The FCC proposed not to require enhanced service providers to pay access charges as long-distance companies do. In general, enhanced service providers supported the FCC's proposal and local telephone companies opposed it.

While the issue is pending, the second round of the debate has begun: The FCC will decide whether the telephone network is becoming congested with data traffic.

The FCC is trying to determine whether it should provide regulatory incentives for telephone companies to develop long-term solutions for transporting data traffic. Should telephone companies route data calls onto other switching systems or packet data networks? Should the network be designed so enhanced services users could stay connected 24 hours a day? Should ISPs be connected to the network via trunks or Primary Rate Interface ISDN?

The FCC's decision could affect the processing of data calls, the communications equipment needed by enhanced service providers and their customers, and the rates they pay.

If you provide or use non-Internet enhanced services, you may want to tell the FCC how your net usage differs from that of ISPs. For example, your calls may last only a few seconds, or peak usage may occur in the middle of the night.

To participate in the FCC proceeding, you can submit formal comments, a written document that includes your views, arguments and supporting data, such as a description of your data traffic, the type of telephone service you or your customers use, and any relevant statistics or surveys from trade associations.

Formal comments must be received by the FCC by March 24. You can also submit responses to other parties' comments by April 23. The text of the FCC's inquiry and general directions for submitting comments can be obtained via the Internet at www.fcc.gov/isp.html.

For more specific information about the required format for comments and procedures for submitting them to the FCC or for assistance with legal arguments, you may want to consult a telecommunications attorney.

If you think some improvements could be made that will enable the public net to handle data more efficiently, now is the time to speak up.

Bahr is a telecommunications attorney with Blooston, Mordkofsky, Jackson & Dickens in Washington, D.C. She can be reached via the Internet at sbahr@aol.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

No harm intended

Your article "ActiveX marks new virus spot" (Feb. 3, page 1) was incorrect, misleading and harmful to my reputation and that of my company, Apropos, Inc., which produces the Exploder control mentioned in the story.

Exploder is a totally harmless ActiveX control that simply powers down users' PCs if they choose to let it run to completion. The purpose of Exploder is to illustrate the inherent security problems in the ActiveX model of operation. Exploder was written expressly to warn users of the potential for dangerous controls.

If your reporters had gone so far as to try out the control, speak with me or read

Cisco and Microsoft prepare for battle

L ast month, I was on the rubber-chicken circuit (the usual off-sites where managers lie about their golf handicaps) when I dropped in at Cisco Systems, Inc.'s big honcho meeting in Monterey, Calif. My job was to outline where the internetworking market is headed, what technologies our Yankee Group 200 large users plan to implement in the next two years, and so forth.

Afterward, I asked these guys, "Who do you see as your major competitors three years out?" I expected to hear the usual: Cabletron Systems, Bay Networks, 3Com, FORE Systems or maybe even Newbridge Networks. Not so. More than half of the Cisco honchos were convinced Microsoft clearly would be their major competitor.

Just two weeks later, I spoke at the Telecommunications Managed Network Summit in San Diego. Who should follow me on the podium but Bill Anderson of Microsoft, who talked about the 115 developers Microsoft has in its public networks group.

Fast-forward another week. I was at a senior management forum at Bank of America in San Ramon, Calif. Bob Herbold, Microsoft executive vice president, outlined the company's "desktop communications strategy" and suggested that Microsoft stands ready to solve desktop and communications problems — no need to shop in two supermarkets!

See a trend here? Can we expect Microsoft to rejigger Windows NT for routing? ("Howard, you idiot, it already has been — Windows NT/Router Version.") Or Cisco to take its Internetworking Operating System and turn itself into a software company?

The answers: yes, yes and yes. (Or maybe I've been spending too much time in the California sun.)

Seriously, here's what is happening: Microsoft is moving from the applications layer down to the network layer. This is the area that manages operating systems and handles TCP/IP control, address management, security, and network and systems management. And — you guessed it — Cisco is moving from the network layer (plumbing) up to the applications layer (at least software that controls networks).

Does Microsoft want to be in the plumbing business? Not really. Microsoft's LAN Manager was a child's toy that tried to attack Novell, Inc.'s NetWare but wasn't up to the task.

Today, however, Microsoft's Windows NT Server edition is giving Novell fits. Microsoft did have one of those famous "strategic alliances" with Cisco — until it went south, and Microsoft substituted Bay for Cisco. Since then, Microsoft has been spitting out bits and pieces of last year's Cairo project, such as Active Directory.

Here's a bigger question: Does Cisco want the applications space? No, if you mean suites and spreadsheets. But yes, if you're talking about network applications such as directories and server optimization products. Cisco and Microsoft would like to provide the Domain Naming System (DNS) that finds the person or workstation you're looking for. Microsoft is developing such a product; Cisco doesn't have one yet, but it's a natural fit.

How big is this new area where Microsoft and Cisco overlap — the so-called "network infrastructure" market? Big. It'll be worth at least $2 billion by 2000, and that's a conservative estimate.

The network infrastructure market consists of three elements: DNS software, the industry-standard directory system that allows applications to use domain names to initiate communications over a TCP/IP network; TCP/IP address management software, which allows TCP/IP addresses, default gateway addresses, and primary and backup DNS addresses to be automatically assigned to workstations; and Web management and server optimization software, which provides server usage statistics and does some load balancing.

It's hard to tell whether Microsoft or Cisco will win the network infrastructure market.

Traditionally, the applications guys get creamed when they try to bogey downward into plumbing. However, the plumbers have never succeeded in moving all the way up into applications, either. But the network infrastructure market is exactly halfway in between.

Microsoft is coming at it from the top down, having to learn the intricacies of plumbing, while Cisco is going from the bottom up, with a strength in networks, but little knowledge of the applications that run on top.

The sure winners will be users. You have two strategic vendors putting lots of resources into this area — so you'll have at least two solutions to choose from.

Who at the user site will decide whether to go with Microsoft or Cisco (or some other player or combination)? Will it be the network designers, who have to make all this stuff actually work? Or the computer types who own the applications and now have to get their hands dirty if their applications are going to run?

My prediction: Whoever gets there first.

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my FAQ on Exploder (www.halcyon.com/mclain/ActiveX/Exploder/FAQ.htm), this misunderstanding would not have occurred.
Fred McLain
Chief executive officer
Apropo
Kirkland, Wash.

Editor's response: In our reporting, some antivirus vendors said they had seen versions of Exploder that not only shut off machines but tampered with files, as well.

These versions were apparently modifications of the original and, thus, were not authored by Mr. McLain. We apologize for the error.

AOL's undoing

In his column, "Let's face it: Flat-rate online pricing is insupportable" (Feb. 17, page 24), Kevin Fong writes: "What we are witnessing is a finite resource — bandwidth — priced as if it were a commodity. As the AOL experi- ence shows, the economics of this situation are insupportable."

There are two problems with this statement. First, the finite resource is dial-in ports, not bandwidth. Second, AOL's experience has proven nothing about flat-rate pricing.

AOL changed its plan to compete with flat-rate Internet service providers but did not have enough modems available for this business model.

A company with AOL's resources and experience in the online market has no excuse for not knowing how many modems would be needed to support even its existing customer base, let alone new accounts.

If anything, AOL has clearly demonstrated that greed can backfire when you try to sell something you don't have.
Don Hurter
Vice president, Dial-up Services
Sirius Solutions, Inc.
San Francisco

Buffers not the answer

In his feature, "Switching's dark side" (Feb. 10, page 35), Thomas Nolle gives some good advice regarding switch deployment in networks. However, he gives the impression that input buffers are a halfway adequate method for solving at least part of network congestion. This is not true.

Buffers lift the basic switch

technology over temporary performance shortfalls in the event of unfavorable traffic patterns. No amount of buffer can prevent a bottleneck on an incorrectly designed trunk/ server attachment.
Antonius Engbersen
Manager
Advanced Networking Laboratory
IBM Research
Hawthorne, N.Y.

Teletoons

• MEDIEVAL SPAMMING •

ON YOUR MARK!... and don't forget to aim for those open windows... GET SET!...

BUY NOW!

SALE!

Exchange answers the mail call

Microsoft tops in test of five client/server messaging packages.

By Edwin Mier, Robert Smithers and Thomas Scavo

ace it: You can't do your job without E-mail. But you don't want setting up and managing messaging to become your whole job, either. And your users are demanding connectivity to proprietary E-mail systems and the Internet.

Today, you're faced with the question of whether to stick with the latest version of venerable LAN-based systems or heed the promise of simpler standards-based software with native Internet connectivity.

The Buyer's Guide chart on page 47 lists the myriad product options, but we tackled the question head-on by testing four leading client/server messaging systems as well as one Internet-standard Simple Mail Transfer Protocol server and Post Office Protocol 3 (POP3) client.

The new beta of Microsoft Exchange Version 5.0 does the best job of integrating Internet mail connectivity and intranet features. It is a feature-rich package that is nicely scalable.

Lotus Development Corp.'s cc:Mail is a good basic mail package, but its nickel-and-dime add-ons contribute to integration headaches.

Lotus Notes is more complex to set up and operate than the other messaging products, but it may be worth the extra work if you intend to take advantage of its other capabilities.

Novell, Inc.'s GroupWise is well integrated with NetWare. But like cc:Mail, you need to screw in add-on modules to realize the package's full potential. And like Notes, GroupWise includes more capabilities than just messaging.

The native Internet combination of Software.com, Inc.'s Post.Office and Qualcomm, Inc.'s Eudora Pro, while a little rough around the edges, provides good basic E-mail messaging but lacks the range of connectivity options the other products provide. Depending on your organization's needs, it can be a viable alternative to the proprietary packages.

All of the packages we tested largely support the same basic E-mail capabilities in their clients, although some of the user interfaces offered for performing these functions are more intuitive and easier to use than others. (Visit Network World Fusion for a complete discussion of the client capabilities of each package.) The packages also have differing intranet capabilities, client and post office connectivity and scalability, and administrator interfaces.

BUYER'S GUIDE LINEUP

Lotus cc:Mail		
Overall score		**6.2**
Post office connectivity and scalability	(20%)	**8**
Intranet features and functionality	(20%)	**2**
Internet mail integration	(20%)	**7**
Administration	(15%)	**5**
Client features	(15%)	**9**
Installation and configuration	(10%)	**7**

Percentages reflect the weight given to each category in determining overall score.

Once all the right cc:Mail pieces are put together properly and in the right order, this is a straightforward, easy-to-use and reliable mail system. Unlike the more ambitious Notes and GroupWise, it is made

to do one thing — E-mail — and it does it well.

However, it's tough to find the right pieces to accomplish what you need to with cc:Mail. Almost everything besides the basic post office/server and client is an extra-cost option. And we found out there can be major integration headaches as well as backward-compatibility problems.

We discovered the most current version of cc:Mail Release 6.1, won't work with the Internet mail module, and the voluminous documentation wasn't much help. Similarly, we had to use a Release 6 client for Windows because the Release 7 client isn't backward-compatible with the Release 5.1 post office.

The administrator's interface to a cc:Mail post office server is an arcane DOS-based interface that's not only hard to access, but unfriendly to use.

On the bright side, cc:Mail post offices that are defined as members of the same group automatically update each other with shared directories and route mail between each other. And cc:Mail users can readily point their cc:Mail client to any cc:Mail server on which they have an authorized user account. In addition, cc:Mail post offices also can now be readily linked with each other over the Internet, though not with Internet mail systems.

cc:Mail routers can interconnect over almost any LAN or WAN link or protocol, including TCP/IP, IPX, VINES IP, SNA, ISDN, X.25 or plain asynchronous connections. cc:Mail routers can also synchronize directories with older NetWare binderies and Banyan Systems, Inc.'s StreetTalk. Our version of the cc:Mail post office could not integrate or synchronize with Novell Directory Services (NDS) or NT domains, however.

Another plus is that cc:Mail — for years the industry's dominant mail system — is offered with post office versions for various platforms, including Windows NT (which we tested), Windows 95, OS/2 and even DOS. It also supports many client platforms, including DOS, Windows, OS/2 and Macintosh.

cc:Mail scores high for connectivity. But its post office structure, which is based on shared files, may not scale as well as mail systems based on structured databases, such as Lotus Notes and Microsoft Exchange. These packages' mail storage structures are more robust and better equipped to support multiple-server topologies and distributed client/server mail-oriented applications.

However, using a variety of Windows clients and

post office servers running on Windows NT Server 4.0, we saw nothing about cc:Mail or its performance that casts doubt on its reliability or stability, or its ability to adequately serve large numbers of mail users on an enterprise scale.

cc:Mail does have some drawbacks that are easier to quantify. For example, cc:Mail currently lacks many of the Internet-oriented features that some leading competitors' mail systems now include, such as a POP3 server.

Connecting Internet mail to cc:Mail isn't easy. Part of the difficulty comes from cc:Mail's two very different add-on options for Internet mail connectivity: the $495 cc:Mail Link to UUCP Release 2.0 and the $1,195 cc:Mail Link to SMTP Release 2.1.

Most E-mail packages use SMTP for the exchange of mail messages with the Internet. cc:Mail's SMTP link only works over a dedicated connection to an Internet service provider. The only option for a dial-up Internet mail connection from cc:Mail requires that you use the UUCP software, which is an old DOS program that resembles a shareware utility. It took us days to properly configure the link, which entails complex and arcane scripting. Once it was completed and debugged, though, it worked well and was reliable.

The bottom line: cc:Mail is a solid, albeit basic, mail system. Integrating all the necessary extra-cost modules can be an expensive pain, and some of them may not work with the other cc:Mail pieces you already have.

Lotus Notes

Overall score		7.1
Post office connectivity and scalability	(20%)	8
Intranet features and functionality	(20%)	8
Internet mail integration	(20%)	5
Administration	(15%)	7
Client features	(15%)	8
Installation and configuration	(10%)	6
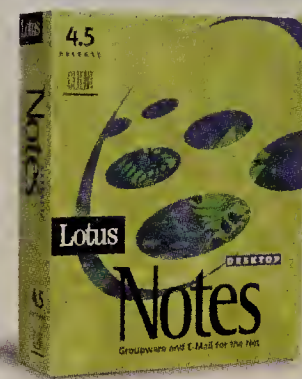
Percentages reflect the weight given to each category in determining overall score.

We fired up Lotus Notes Version 4.5 on a Windows NT 4.0 server. Notes Mail was perhaps the most complex to install and configure of the mail systems we tested. It is feature-rich, but a mail administrator had better plan to attend special Lotus training to learn how to use it effectively.

It's true that some intranet-oriented features have been added in the latest Notes Server Version 4.5 — a POP3 server for handling mail clients, for example, in addition to the now-integrated Web server.

However, Internet mail connectivity still hasn't been integrated. Indeed, the key component is a separate software package called SMTP/Multi-purpose Internet Mail Extensions (MIME) Message Transfer Agent (MTA). It comes on a separate CD-ROM, and you have to install and configure it separately from the main server.

The SMTP link is difficult to set up — more difficult than cc:Mail's and much more difficult than Exchange's. The documentation is of little help. After two days of trying to configure the SMTP link to Internet mail, we and a lot of Lotus technical support folks discovered there's no way the server can dial in to an ISP for Internet mail collection and delivery.

There is no dial mechanism inherent in the SMTP/MIME MTA package, and there is no link to the Remote Access Server (RAS) dial-up service in NT Server.

After another day of hacking, we finally got the Notes SMTP/MIME MTA to relay mail from Notes Mail clients to the Internet via a dedicated connection, but only in one direction — outbound.

Cast stereotypes aside when figuring cost of ownership

By Gary Rowe

I f you believe the stereotypes, you think Internet-based mail is fast, ubiquitous and inexpensive, while proprietary client/server messaging is expensive and locks you in to a single vendor but provides state-of-the-art functionality.

When you examine the full slate of factors that determines your overall cost of messaging system ownership, you'll find those stereotypes are not 100% accurate.

True, Internet-based mail, in many environments, will have lower cost of ownership. But it may not be as dramatic as you think once you look at all the factors.

Things start to look good when you consider the cost for client and server software is low or even nonexistent. Capital costs also are low, given that you don't need high-powered machines to run the software and the intrinsic bandwidth efficiency of the Simple Mail Transfer Protocol, Post Office Protocol 3 (POP3) and, to a lesser degree, the Internet Message Access Protocol 4 (IMAP4) holds down network costs. Plus, you don't have to buy as many gateways with Internet mail, especially if many of your trading partners are using the same standards.

Therefore, it is possible to construct an Internet mail environment for next to nothing using Qualcomm, Inc.'s Eudora Lite as a client, a Unix sendmail server and the host of directory, administration, management and other components now available. In fact, many universities have built large messaging services for low cost by tapping free software and student labor.

However, if you are outside the university community and build a similar environment, your support costs could be higher because you're largely on your own when figuring out how to make it all work. And you may not get as robust management and administration tools as you would with proprietary products, which could mean higher operational costs.

There's also the functionality gap, which favors the growing base of products from vendors such as Microsoft Corp., Lotus Development Corp. and Novell, Inc.

In short, determining cost of ownership in a large environment is more complex than just adding up the cost of client and server software, whether that software is Internet-based or proprietary. In many large organizations it is likely that costs for training, administration, migration, integration and application development — not to mention the price of lost productivity while users adapt to a new mail environment — will be many times the cost of the client/server software alone.

Even the battle lines between contestants are blurring as proprietary vendors embrace the full suite of Internet standards while Internet mail vendors add more features to their offerings. For example, Lotus recently announced a POP3 client with IMAP4 support. Netscape Communications Corp. will provide new offerings with enhanced groupware functionality and migration kits for moving legacy environments to the Internet. At this rate, in a few years, there may be little difference between the camps, with the possible exception of support.

In the final analysis, Internet mail may yield favorable cost of ownership for users starting with a clean slate or with a relatively simple environment. A full Internet mail implementation should also position you to take advantage of the explosion of new and innovative Internet-based applications.

For users that have high support demands, require advanced functionality and have a lot of legacy integration issues, proprietary messaging products that can be integrated with the Internet may be the most cost-effective solution.

Rowe is a principal at Rapport Communication, a consultancy that focuses on messaging, groupware and electronic commerce. He can be reached via the Internet at gjrowe@attmail.com.

MESSAGING COST-OF-OWNERSHIP FACTORS
Highlighted text indicates which type of mail gets the nod for each area.

	Internet mail	Proprietary mail
Migration/coexistence	Few tools available today, but vendors such as Netscape are actively investing in this area.	**Rich tools, including gateways, directory synchronization and migration tool kits, are readily available, along with vendor-provided migration planning services.**
Training	**Easy-to-use products result in relatively low training costs.**	Products are relatively intuitive, but taking advantage of high-end functionality is a challenge for nontechnical users.
Administration	Tools are less developed.	**Tools are strong and support centralized administration.**
Network	**Intrinsically efficient mail protocols require less bandwidth.**	Higher bandwidth consumption is required to gain greater functionality.
Client/server license fees	**Free or low-cost.**	Higher cost for more functional clients and servers, but new Internet-enabled offerings may close the gap.
Support services	Low-cost or free software leaves you mostly on your own.	**Vendors generally provide high-quality support.**
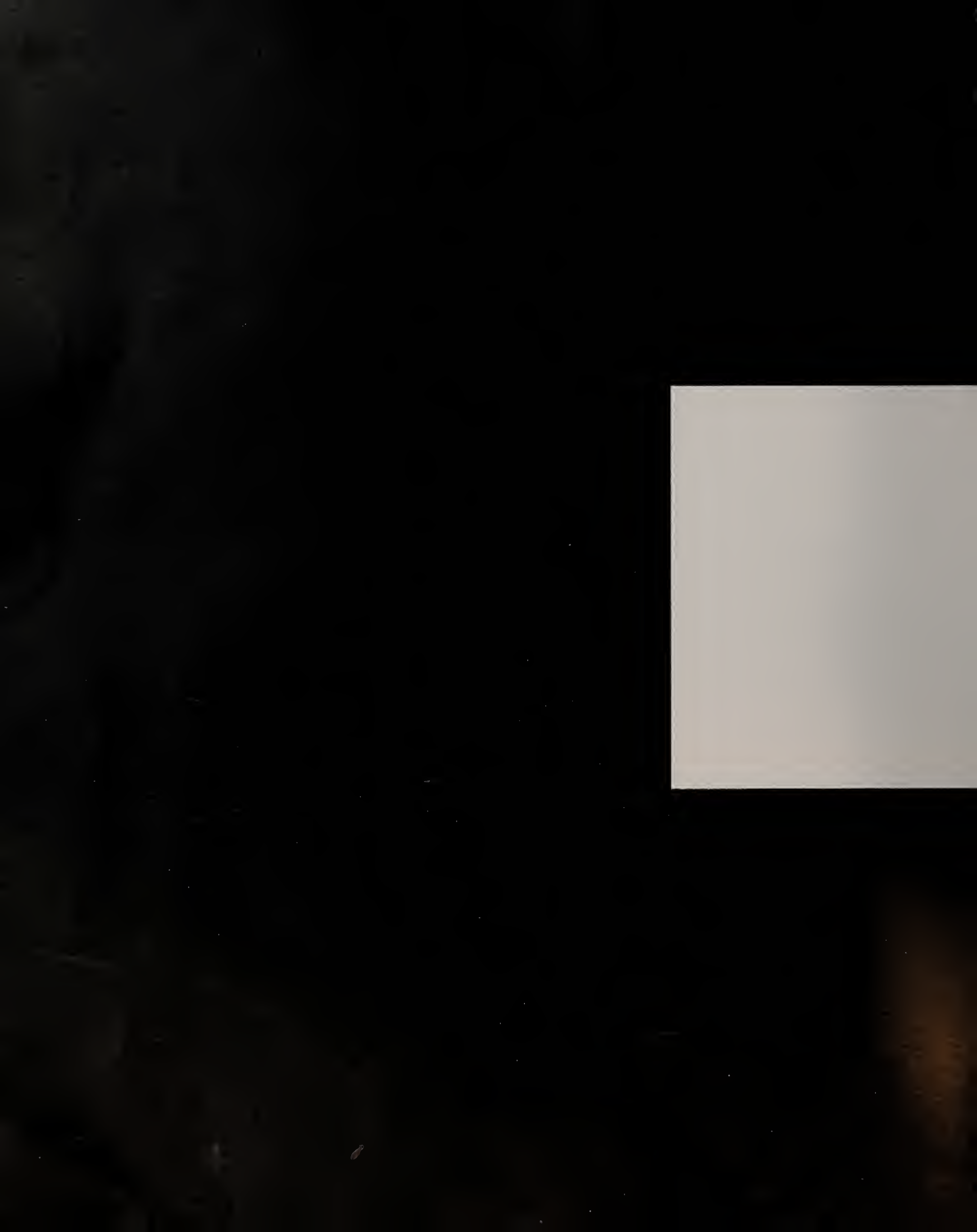
Configuring and using Notes Mail involves entering lots of information into database-type fields and screen templates. There are too many of these fields to fill in, and we found out later, some are redundant and unnecessary.

The good news is that Lotus Notes is tailorable. With extensive API support, users who are able programmers and scripters can extend and tailor Notes Server and Notes Mail. Indeed, this package is geared for customers who want to extend features or add their own applications, and who are willing to put the time and effort into learning the myriad details of Notes Server.

Notes Server and Notes Mail clients are heavy. You need 48M bytes of RAM and 500M bytes of available disk space for the server platform. On the plus side, though, Notes Server versions are available for a broad range of server platforms — NT 4.0, which we tested, IBM AIX, HP-UX, Macintosh and even as a NetWare Loadable Module that runs on a NetWare server. The list of supported client platforms is just as diverse.

Notes Server doesn't have many built-in or optional links to other leading mail systems; only a gateway to cc:Mail is available. However, Notes Server now includes a full set of intranet features, including an integral Web server and POP3 support.

The package is complex and difficult to install. Numerous NT file edits were required, although these are detailed in the documentation. If you've got the time and resources to learn it thoroughly, or if you want a package with a good mail system that you can tailor or expand for your own environment and applications, then Notes is a good candidate.

Microsoft Exchange

Microsoft Exchange		
Overall score		**8.7**
Post office connectivity and scalability	(20%)	8
Intranet features and functionality	(20%)	9
Internet mail integration	(20%)	9
Administration	(15%)	10
Client features	(15%)	8
Installation and configuration	(10%)	8

Percentages reflect the weight given to each category in determining overall score.

We tested Version 5.0 (Build 1389.7, a late beta release) of Microsoft Exchange, a feature-rich client/server package.

Exchange server is the most intuitive mail system we tested in terms of setup and configuration. Everything is done via point-and-click, fill-in-the-blanks screens, which are arranged as tabs in logical order. Exchange's strengths include integration with NT, the ability to be customized, functional richness and good, clean integrated Internet connectivity. From a price-per-user perspective, Exchange 5.0's costs should be similar to the 4.0 version.

This is an enterprise-class mail package of moderate complexity. While the administrator's interface for configuring Exchange can be called intuitive, that doesn't mean the process is easy. Final documentation for Version 5.0 was not available, which put us at a disadvantage. Relying on the extensive on-screen help, we were able to deploy the complete local client and server. However, to get the Internet mail link prop-

Exchange tips

During our evaluation, the Internet Mail Server component of Microsoft Exchange wouldn't start automatically with the main post office server. It turned out that instead of using the Internet domain name for our Internet service providers' mail server, we had to use its Internet address.

Also, some of the data fields that have to be filled in to configure the link were too short for the host names we had to enter. You can get around this, too, by entering the nodes' IP addresses instead of their names.

The Exchange post office runs only on Windows NT Server, reportedly on NT Server 3.51 with Service Pack 5 (SP5). But you're better off planning on NT 4.0 with SP2 to fully use all of Exchange's components, such as Web browser access to E-mail.

We also found out, the hard way, that some bug fixes have to be applied to the Windows NT Server 4.0 SP2 environment before some components of the operating system — such as Remote Access Server — will work properly in conjunction with the Exchange mail package.

erly running required about an hour on the phone with Microsoft technical support.

Still, if any of the five mail packages we tested could be installed and configured for Internet mail connectivity without requiring the special expertise of an Internet mail consultant, Microsoft Exchange is it.

A couple of small bugs turned up, though. For example, we found that passwords are not checked during the installation when you enter them. Any slip in entering a password isn't noted by the system until much later in the installation process. In our case, it meant the whole installation up to that point had to be aborted and started over.

The installation procedure automatically sets up an administrator's mailbox, which is used to fully configure the package. It can be accessed directly from the server or from any workstation. Exchange includes numerous "connectors" and Internet-related servers such as Internet Mail Server, which are separate options with some of the other mail packages if they are available at all. For example, Exchange 5.0 includes fully functional support for Lightweight Directory Access Protocol (LDAP) built in to both its clients and the server.

Version 5.0 of Exchange includes integral Secure Sockets Layer encryption as well as a POP3 server. With POP3 support, clients can access their Exchange mail using any Internet POP3-based, browser-type mail reader, including Eudora and Navigator. The product also includes a built-in Internet news server that supports the Internet-standard Network News Transfer Protocol. For handling mail attachments with Internet mail, you can choose MIME or UUencode on a case-by-case basis, according to what the recipient prefers.

In addition, Microsoft includes with Exchange Server links for connecting to cc:Mail and Microsoft Mail post office servers, as well as migration tools for moving from Microsoft Mail, cc:Mail and Novell's GroupWise to Exchange.

From a scalability perspective, we rate Exchange fairly high. A link to other Exchange servers is included with the high-end Enterprise version of Exchange, though not with the basic package. Any number of servers can be distributed and interconnected with the software link. Shared mailboxes can be accessed from any number of users, anywhere in the network, and Exchange can automatically manage their synchronization.

As you would expect, Exchange integrates well with NT domains. This means that users have a single logon and a single, consistent place to go for directory information about other users. User account setup and administration is easy with common, consistent pass-

words and access rights. Mail attachments can be double-clicked, which automatically invokes whatever Microsoft application was used to generate the attachment. It worked well for us with Word and Excel.

The Internet mail link from Exchange uses SMTP. It was the only package we tested that enabled us to set up a dial-up SMTP link to our ISP's Internet mail server via a straightforward graphical user interface.

Dial-up and logon to the ISP's mail server is handled via scripting as part of NT Server's RAS — which is the hardest part of setting this up — but it works well and is reliable. And there are rich scheduling capabilities that let you establish, for example, how long the server waits with outbound Internet mail before dialing up and delivering it. You can also determine when and how frequently the server calls to retrieve incoming Internet mail, which it then immediately sorts and delivers.

There are only a few drawbacks. It's often hard to find what you're looking for, especially from the administrator's interface, but clients can do most operations intuitively.

While we found Exchange the most functionally rich and easy to use, it is also one of the most resource-demanding packages we tested. The server platform has to be a powerful one with a lot of RAM (at least 32M bytes is recommended). And the Exchange Server portion requires a half-gigabyte of available disk storage. Plan to run Exchange on its own high-powered Windows NT 4.0 server.

Novell GroupWise

Novell GroupWise		
Overall score		**6.3**
Post office connectivity and scalability	(20%)	8
Intranet features and functionality	(20%)	5
Internet mail integration	(20%)	4
Administration	(15%)	7
Client features	(15%)	8
Installation and configuration	(10%)	6

Percentages reflect the weight given to each category in determining overall score.

Novell's GroupWise is to the NetWare faithful what Exchange is to Microsoft NT shops. We tested GroupWise 5.0 on the requisite NetWare 4.1 server platform; it was the only leading package we didn't test on Windows NT Server. There is a version of the GroupWise server, called the NT Agent, that runs on NT, but we chose to use the native NetWare platform.

We rate GroupWise on a par with other leading

packages, including cc:Mail, Exchange and Notes, in terms of post office connectivity and scalability. The abundance of available, although not integrated, link options is one reason, and the close integration of GroupWise with NetWare and NDS is another.

Multiple GroupWise post offices are easily interconnected via NDS' treelike structure. And user accounts are easily created on the NDS tree, as well. In addition, NDS provides its own replication and synchronization services to facilitate enterprisewide GroupWise deployments.

Clearly, GroupWise is most appealing to organizations that have networks based on NDS and administrators who already know NetWare. The administrator's interface to GroupWise is a revised form of the NWAdmin utility that NetWare 4.1 users are accustomed to. The administrator's inter-

face is revised automatically by GroupWise when it is installed.

We tested GroupWise over Novell's proprietary IPX protocol. In organizations where TCP/IP is emerging as the strategic direction, GroupWise — and NetWare — still need some work.

It is possible to integrate a form of TCP/IP under a NetWare/GroupWise network, but this is an arduous task. And with Version 5.0 of GroupWise, we saw no reason for undertaking this daunting chore. The version does not support POP3, for example, so Web browser clients can't send or receive mail with GroupWise. A separate Web server software module is available for GroupWise, but it isn't integral, and it wouldn't seem that the vast Novell-proprietary IPX installed base would have much use for it.

Indeed, from an intranet perspective, GroupWise 5.0 has a ways to go. But Novell has promised that Version 6.0, expected out by the middle of this year, will include POP3 server support as well as an integral Web server, client and server support for the LDAP directory protocol, and other Internet-oriented features.

The Internet mail link, SMTP MTA, is another one of those separate modules that you have to integrate yourself. It provides limited Internet mail connectivity — there's

HOW WE DID IT

We collaborated with Princeton, N.J.-based Internet service provider Global Enterprise Services (GES) for our testing. GES shared with us its customers' growing preference for private-to-Internet mail connectivity over dial-up connections. We therefore highlighted these E-mail packages' ability to link to the Internet over a dial-up line. Many large organizations today still connect to their ISP and its mail server via high-speed dedicated links, so we tested this capability, too.

GES set up numerous E-mail test accounts for us within its network. One supported E-mail system connectivity via Simple Mail Transfer Protocol, another that Post Office Protocol 3 and yet another via supported sendmail and Unix-to-Unix Copy Protocol. All of the E-mail accounts were accessible via a dial-up link or permanent connection over PPP.

We asked each vendor to supply the version of its post office server for Windows NT Server 4.0 (except GroupWise, which ran on a NetWare 4.1 server) and client software for Windows 95 workstations. The clients we used were a mix of desktop and laptop systems ranging from 25-MHz 486 machines to 133-MHz Pentiums, with 16M to 64M bytes of RAM.

The post office server platforms were 100-MHz Pentium servers with 64M bytes of RAM housed in a compact ChatCom, Inc. Chat-Express multislot chassis.

We used Hayes Microcomputer Products, Inc. SmartModem Optima modems for remote clients and dial-up links to the ISP. We simulated leased-line connections from our labs to the ISP via dial connections at 28.8K bit/sec.
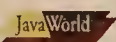
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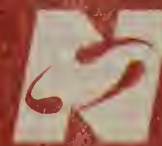
NETWORK PERIPHERALS

Circle Reader Service #12

no dial-up capability, for example — and it seems the only way to get to the ISP from an IPX-based NetWare server is via an external router or perhaps by integrating Novell's multiprotocol router software on the same server.

The documentation we received was much too lean. The Quick-start guide, for example, includes directions in many different languages, but the directions provided in English were insufficient to get the job done.

NetWare users will embrace GroupWise. In non-NetWare communities, though, users may find the package limited and the requirement to integrate so many pieces annoying.

Eudora Pro/Post.Office		
Overall score		5.9
Post office connectivity and scalability	(20%)	5
Intranet features and functionality	(20%)	7
Internet mail integration	(20%)	7
Administration	(15%)	5
Client features	(15%)	8
Installation and configuration	(10%)	5

Percentages reflect the weight given to each category in determining overall score.

Most popular enterprise mail systems employ proprietary message formats and protocols, and connect with Internet mail via special gateways and links. But how about packages that are based purely on Internet protocols?

We tested one such leading server software package, Post.Office from Software.com, in conjunction with one of the most popular Internet mail clients, Eudora Pro 3.0 from Qualcomm.

Post.Office is an affordable server that runs on most leading Unix systems. The vendor also offers a version that runs on NT, Post.Office Version 2.0.1, which

we tested.

The package includes good SMTP support for interconnecting with your ISP's mail server, as you would expect. However, SMTP interaction over a dial-up connection is not supported. You need a dedicated link to your ISP's mail server.

Post.Office has a ways to go before it can be considered truly integrated with NT. While it is possible to set up Post.Office accounts using the same user account database as NT — providing users with a single logon/password — this is tough to accomplish.

The most awkward aspect of setting up and configuring Post.Office is the administrator's interface, which has to be a Web browser. However, NT's integral Internet Explorer Web browser won't work. The vendor blamed it on Microsoft's browser implementation and told us to use Netscape's browser instead.

We installed a Netscape browser but then ran into other problems. The Web server used by Post.Office for administrative access conflicted with another Web server running on the same platform. We shut down the other Web server to resolve the problem.

Configuring Post.Office via a Web browser involves meticulously filling out and submitting forms. However, once it is finally set up and running, adding new users or changing user accounts is simple. Also, after being properly set up, the mail server ran reliably for the duration of the testing.

The Post.Office documentation is good — it is well organized in a single handbook. Online help is invoked via a Web hyperlink over the Internet directly to the appropriate page on the vendor's Web site.

There are no links, integral or optional, for native connections to any of the other leading mail systems we tested. However, Post.Office purportedly will talk to any other SMTP compliant server, so you could presumably reach a cc:Mail or Exchange server via those products' respective SMTP gateways.

As you might expect, Post.Office is richer in intranet-type features and protocol support than some other leading mail systems, certainly more so than cc:Mail

and GroupWise. Post.Office includes a POP3 server — that's the only protocol it supports for mail client access — as well as an integral Web server, as already noted.

If you are seeking just basic E-mail messaging and don't have to worry about transitioning from or interoperating with one or more of the existing, leading E-mail packages, and if your organization's IT strategy is intranet-oriented, then we conclude that, yes, this is a viable alternative.

It's certainly a more affordable alternative than some of the other popular mail systems we tested. If you want or need some of the added capabilities inherent in the other leading packages — groupware or database features, for example — then you may find the Post.Office/Eudora combination lacking.

Mier is president and founder of Mier Communications, Inc., a network consultancy and product test center in Princeton Junction, N.J. Smithers is manager of test services and Scavo is a systems integration specialist ast Mier Communications. They can be reached at (609) 275-7311, or via E-mail at ed@mier.com, rob@mier.com or tom@mier.com.

In June and July, Network World Technical Seminars will run a seminar titled Next-Generation Messaging: Capitalizing on Internet & Client/Server E-Mail. For more information, please call (800) 643-4668.

Invasion of the Internet standards

By Kathy Scott

Internet standards have made a giant leap into the world of client/server messaging, bringing more openness, flexibility and simplicity to the messaging environment.

The chart beginning on page 47 shows that most E-mail products support native Internet standards such as Post Office Protocol 3 (POP3) and Simple Mail Transfer Protocol. And nearly all of the companies listed support Multi-purpose Internet Mail Extensions (MIME), with Control Data Systems, Inc., Netscape Communications Corp., SoftArc, Inc., Software.com, Inc. and Wall Data, Inc. supporting Secure MIME (S/MIME), an emerging standard for secure E-mail.

During the past six to 12 months, vendors have started adding support for the Internet Message Access Protocol4 (IMAP4) and the Lightweight Directory Access Protocol (LDAP). Control Data Systems, Enterprise Solutions, Ltd., Microsoft Corp. and Netscape have also added X.509 security certificates for message encryption.

Amid all the standards activity, Joyce Graff, research director in electronic workplace technolo-

gies at Gartner Group, Inc. in Stamford, Conn., raises a familiar warning: The fidelity with which the standards have been implemented is sometimes suspect. You may be left with least-common-denominator implementations due to myriad vendor-specific extensions.

Still, the standards-based products can help you get the message across. For example, Graff says users who need to access their messages from several different clients — such as their work, home and laptop PCs — should consider products that support IMAP4. Such products tend to be more robust, scalable and manageable than those based on Internet mail server protocol POP3. While POP3 provides for bulk downloading of messages from server to client, IMAP4 allows you to share file space on the server and selectively download messages.

Indeed, IMAP4 is increasingly being considered as a key intranet component for many organizations, according to "The Rapport Messaging Review," published by Rapport Communication.

If such Internet messaging is to become a viable alternative to LAN-based E-mail, sources say, it requires a directory service that is reliable, scalable,

manageable and secure. LDAP may fit the bill, and although it is not yet a ratified standard, you'll note from the chart that nine vendors have already embraced it. LDAP gives users directory information access without the huge overhead involved in using the DAP that came out of the X.500 standard.

Netscape was among the LDAP pioneers when it entered the E-mail landscape eight or nine months ago, says Tim Sloane, director of Internet research at Boston-based Aberdeen Group, Inc. Netscape, he says, supports the notion that access to directories, no matter where they are, is fundamental to messaging.

David Zimmer, president of American Eagle Group in Warrington, Pa., says LDAP can be used as more than just an E-mail directory. It can be tied in to databases, for example, and used for groupware-related applications such as scheduling. Zimmer says LDAP will level the vendor playing field for directory synchronization and directory updates.

Mark Levitt, research manager for electronic messaging at International Data Corp. in Framingham, Mass., sees another potential benefit. "LDAP could revive X.500," he says, by evolving into a more

complex protocol that includes X.500-like functionality such as security and server-to-server communication.

But Eric Arnum, editor of "Electronic Mail and Messaging Systems," a Washington, D.C.-based newsletter, isn't sold on the whole idea of standards. "You could buy a product on standards, but a year from now, you'd be sorry when you realize that it's difficult to administer, impossible to find a message that's been lost, and extremely difficult to give management any kind of statistics on usage or throughput or performance," he warns.

Graff concurs. "Most developers of Internet standards-based products have traditionally not paid much attention at all to management tools," she says. "The community of buyers they were catering to were not running high-performance, high-reliability environments."

Many vendors, such as Control Data Systems, Isocor and Software.com, are beginning to change that tune and are coming out with good management tools for SMTP/MIME products, Graf says.

To further leverage your messaging infrastructure investment, you need a robust application environment, says James Greene, industry analyst at Summit Strategies, Inc., a market strategy and consulting firm in Boston. Products such as Lotus Notes and Microsoft Exchange provide the power to incorporate your messaging system with distributed databases, workflow, groupware and other distributed applications.

While not as robust as Notes or Exchange, products with some groupware and fax or voice integration utilities are available, or soon will be, from most of the vendors listed in the chart.

"A lot of the messaging products let users do much more creative things and let more 'freight' be shipped," Graff says. "People need to plan for adequate bandwidth and need to make sure that [the network] can stand up under the load. A reliability issue quickly becomes a customer satisfaction issue." ∎

CLIENT/SERVER E-MAIL SOFTWARE

Company	Product C: Client S: Server	Client/server connection	Client platform	Attachments supported (Binary, Compound documents, Forms, HTML packaging/display, MIME, Other)						Directory access method	Server platform	Message store facility	Directory services architecture (Proprietary, Flat file, X.500-like, X.500 DAP-/DSP-compliant, Other)					Price C: Client/no. of users M: Mailbox S: Server/no. of users
Active Voice Corp. (206) 441-4700 www.activevoice.com	C: ViewMail, ViewCall, PhoneMax S: Repartee, Replay	Proprietary, HTTP/HTML	Windows 3.X, NT, 95	●						MAPI	OS/2	Custom database	●					C: $139/1 M: $59-$139/1-250+ S: $10,000-$85,000/ 50-65,000
CE Software, Inc. (515) 221-1801 www.cesoft.com	C: QuickMail LAN 3.6 S: QuickMail Server	Proprietary	Macintosh, Windows 3.X, 95	●	●			●		Proprietary name server	Macintosh	Native file	●					C: $36/1 S: Incl. w/client
	C: QuickMail Pro 1.0 S: Post.Office 2.0	POP3	Macintosh, Windows 3.X, 95	●	●			●		LDAP, proprietary, Finger, Ph	Windows NT	Proprietary	●					C: $69.95/1 (1) S: $3,995/100
Claris Corp. (800) 544-8554 www.claris.com	C: Claris Emailer 1.1 S: OfficeMail 1.11	Proprietary, POP3	Macintosh	●				●			Macintosh	Commercial database	●					C: $49/1 S: $299/1-100
CommTouch Software, Inc. (800) 638-6824 www.commtouch.com	C: Pronto97	IMAP4, POP3	Windows NT, 95	●				●		LDAP	Not applicable	Not applicable						C: $69/1
	C: Pronto Mail-Family Edition	POP3	Windows NT, 95	●				●			Not applicable	Not applicable						C: Free
	C: Pronto Mail-Professional Edition	POP3	Windows 3.X, NT, 95	●				●			Not applicable	Not applicable						C: Free
Control Data Systems, Inc. (800) 257-6736 www.cdc.com	S: IntraStore Server 97	HTTP/HTML, IMAP4, POP3, shared file, other	Not applicable	●	●	●	●	●	●	Finger, HTTP/HTML, LDAP, authenticated LDAP, MAPI, Ph, X.500 DAP, WHOIS	Unix	Custom database, native file, shared file				●		C: $10-$40/ 1-150,000 S: $2,000/unlimited
Coordinate.com (Internet division of Banyan Systems, Inc.) (617) 398-7900 www.coordinate.com	C: BeyondMail Professional Internet Edition 3.0	POP3	Windows NT, 95	●	●	●				Switchboard, StreetTalk	Not applicable	Not applicable						C: $69/1
Enterprise Solutions, Ltd. (888) 396-6245 www.exmmail.com	C: EXM/User Agent S: EXM/MTA and MS	P7, other	DOS, Macintosh, Unix, Windows 3.X, NT, 95	●	●	●	●	●		LDAP, authenticated LDAP, X.500 DAP	Unix, Windows NT	X.400 P7				●		C: $30-$120/ 10-10,000 S: $845-$1,495/ unlimited
The Esys Corp. (403) 424-4922 www.simeon.com	C: Simeon 4.1 S: Simeon Server 1.4.3	IMAP4, other	DOS, Macintosh, OS/2, Unix, Windows 3.X, NT, 95	●		●		●		LDAP, authenticated LDAP	Unix, Windows NT	Custom database	●	●				C: $75/1 S: $3,995/unlimited
Eudora Division of Qualcomm, Inc. (800) 238-3672 www.eudora.com	C: Eudora Pro for Windows 3.0	POP3, other	Macintosh, Windows 3.X, NT, 95	●	●			●	●	Finger, Ph	Not applicable	Not applicable						C: $89/1 (2)
Hewlett-Packard Co. (800) 637-7740 www.eco.hp.com	C: OpenMail 4.10 S: OpenMail 5.0	Proprietary, POP3, P7	Macintosh, Unix, Web browser, Windows 3.X, NT, 95	●	●	●	●	●		HP User Agent Layer	Unix, Windows NT	Native file				●		C: $10/1 M: $10/1 S: $50/1
Infinite Technologies (800) 678-1097 www.ihub.com	C: ExpressIT 2000 Version 1.0	HTTP/HTML, IMAP4, POP3, other	Windows NT, 95	●	●			●		MAPI	Not applicable	Not applicable						C: $49/1 (3)

Products highlighted in color were tested • Blue Ribbon Award winner

CHART COMPILED BY KATHY SCOTT

Footnotes: (1) Site licenses available. (2) $69/1 when ordered from eudora.com. (3) Quantity discounts available. (4) $995/single-processor license; $2,995/multiprocessor license. (5) WebAccess available free. NIS = Network Information System RPC = Remote procedure call

CLIENT/SERVER E-MAIL SOFTWARE

Company	Product C: Client S: Server	Client/server connection	Client platform	Attachments supported						Directory access method	Server platform	Message store facility	Directory services architecture					Price C: Client/no. of users M: Mailbox S: Server/no. of users
				Binary	Compound documents	Forms	HTML packaging/display	MIME	Other				Proprietary	Flat file	X.500-like	X.500 DAP-/DSP-compliant	Other	
Innosoft International, Inc. (818) 919-3600 www.innosoft.com	S: PMDF e-Mail Interconnect	HTTP/HTML, IMAP4, POP3	Not applicable								Unix, other	Native file				•	•	S: $9,000-$15,000/ unlimited
Ipswitch, Inc. (617) 676-5700 www.ipswitch.com	S: IMail Server for Windows NT 3.0	POP3	Not applicable	•	•	•		•	•	DNS	Windows NT	Native file					•	S: $495/unlimited
Isocor (310) 581-8100 www.isocor.com	S: Isoplex 4.2	Proprietary, P7, shared file	Not applicable	•	•	•		•		LDAP, MAPI, X.500 DAP	DOS, OS/2, Unix, Windows NT, other	Custom database				•		S: $6,550+/ unlimited
Lotus Development Corp. (800) 346-1305 www.lotus.com	C: Lotus Notes 4.5 with Lotus Notes Mail and Lotus Notes Desktop S: Lotus Domino 4.5	Proprietary, HTTP/HTML, POP3, RPC	Macintosh, OS/2, Unix, Windows 3.X, NT, 95	•	•	•	•	•	•	HTTP/HTML, MAPI, Notes, RPC	NLM, OS/2, Unix, Windows 3.X, NT, 95	Custom database			•			C: $69/1 M: $35 S: (4)
	C: cc:Mail 7.0	Proprietary	Windows NT, 95	•		•				MAPI	DOS, Macintosh, NLM, OS/2, Unix, Windows 3.X, NT, 95	Shared file	•	•				C: $55/1 S: $695/unlimited up to 4G bytes
MetaInfo, Inc. (206) 674-3700 www.metainfo.com	S: Sendmail with POP3 for Windows NT	POP3	Not applicable					•		Flat file	Windows NT	Native file	•					S: $495/unlimited
Micro Computer Systems, Inc. (972) 659-1514 www.mcsdallas.com	C: Calypso	IMAP4, POP3	Windows NT, 95	•	•			•			Not applicable	Not applicable						C: $79.95/1 (3)
Microsoft Corp. (800) 426-9400 www.microsoft.com	C: Exchange Client 5.0 S: Exchange Server 5.0	HTTP/HTML, POP3, RPC, MS Mail, other	DOS, Macintosh, Web browser, Windows 3.X, NT, 95	•	•	•	•	•	•	LDAP, authenticated LDAP, MAPI	Windows NT	Custom database			•			Pricing unavailable at press time
NetManage, Inc. (408) 973-7171 www.netmanage.com	S: post.office	HTTP/HTML, IMAP4, POP3, RPC, shared file	Not applicable	•	•	•		•	•	HTTP/HTML, LDAP	Unix, other	Custom database, native file, shared file		•				S: $995/500
	C: Z-Mail Pro 6.0	HTTP/HTML, IMAP4, POP3	Macintosh, Unix, Windows 3.X, NT, 95	•		•	•	•		WHOIS++	Not applicable	Not applicable						C: $55-$95/1
Netscape Communications Corp. (415) 937-2555 www.netscape.com	C: Communicator S: SuiteSpot 3.0	HTTP/HTML, IMAP4, POP3, other	Macintosh, OS/2, Unix, Web browser, Windows 3.X, NT, 95	•	•	•		•		HTTP/HTML, LDAP, authenticated LDAP, X.500 DAP	Unix, Windows NT, 95, other	Native file, shared file				•	•	C: $59/1 S: $4,995/unlimited
Novell, Inc. (800) 453-1267 www.novell.com/groupwise	C: GroupWise 5 S: GroupWise 5	Proprietary, HTTP/HTML, shared file	Java applet, Macintosh, OS/2, Unix, Web browser, Windows 3.X, NT, 95	•	•	•	•	•	•	HTTP/HTML, LDAP, MAPI, NDS	NLM, Unix, Windows NT	Custom database, shared file				•	•	M: $718/5 (5)
Oracle Corp. (415) 506-7000 www.oracle.com	C: InterOffice 4.0.5 S: InterOffice 4.0.5	Proprietary client/server mechanism, HTTP/HTML, other	Macintosh, Unix, Web browser, Windows 3.X, NT, 95	•			•	•		HTTP/HTML, MAPI	Unix, Windows NT, other	Commercial database				•	•	C: $95/1 M: Incl. w/ client S: Incl. w/ client
Siren Software, Inc. (415) 322-0600 www.siren.com	C: Siren Mail 3.1.1	IMAP4, POP3	Macintosh, Windows 3.X, NT, 95	•	•			•		LDAP	Not applicable	Not applicable						C: $100/1
SoftArc, Inc. (800) 763-8272 www.softarc.com	C: FirstClass 3.5 S: FirstClass 3.5	Proprietary	DOS, Macintosh, OS/2, Windows 3.X, NT, 95, other		•	•		•		First Class	Macintosh, OS/2, Windows NT	Shared file	•					C: $35-$79/5-1,000 S: $495/5
Software.com, Inc. (805) 882-2470 www.software.com	S: Post.Office 2.0	HTTP/HTML, POP3	Not applicable					•		Not applicable	Unix, Windows NT, other	Native file					•	S: $149-$995/ 10-500
Sun Microsystems, Inc. (415) 781-8140 www.sun.com/solstice	C: Internet Mail Client S: Internet Mail Server 2.0	IMAP4, POP3, other	Unix, Windows 3.X, NT, 95	•	•			•		NIS/NIS+	Unix	Native file					•	C: Free S: $495/unlimited
Verimation, Inc. (800) 967-6366 www.verimation.se/	C: Memo for Windows 2.2.1 S: Memo Base 5.2	3270 emulation, TCP/IP, APPC	DOS, Java applet, Macintosh, OS/2, Unix, Windows 3.X, NT, 95	•	•	•		•		MAPI	Windows NT, other	Custom database	•					C: $35-$200/ 10-unlimited S: $15-$149/1
Wall Data, Inc. (800) 915-9255 www.walldata.com	C: Rumba Mail	POP3, other	Windows NT, 95	•						MAPI	Not applicable	Not applicable						C: $49/1-unlimited

Products highlighted in color were tested • Blue Ribbon Award winner
Footnotes: (1) Site licenses available. (3) Quantity discounts available. (5) WebAccess available free. NIS = Network Information System
(2) $69/1 when ordered from eudora.com. (4) $995/single-processor license; $2,995/multiprocessor license. RPC = Remote procedure call

CHART COMPILED BY KATHY SCOTT

Management Strategies

Covering: Career Insights and Innovations
in Managing Staff, Budgets and Technology

It's official: You're hot

Survey shows the hottest jobs are in the networking field.

By Kathy Scott

Feeling warm under the collar? You should be. You're hot, according to the "1997 Annual Report on Hot Jobs and Not So Hot Jobs," which finds that eight of the 13 hottest jobs require networking know-how.

The report is put out by Christian & Timbers, Inc., an executive search firm that specializes in placement of technical professionals in senior-level positions.

Go to Fusion to get more information about this hot jobs study plus a link to a Christian & Timbers report that predicted impressive Internet job growth for last year.

Enter the number below in the DocFinder box on the home page.

Network World Fusion 1028

www.nwfusion.com

The hot jobs report says the toughest positions to fill range from executives hired on a temporary basis to vice presidents in charge of call centers (see graphic).

To reach its conclusion, Christian & Timbers tracked the hiring activities of its clients and monitored 1996 employment advertising in *The Boston Globe*,

San Jose Mercury News and a number of high-tech journals. The report covers the employment needs of firms in industries such as information technology, financial services, insurance, health care, biotechnology, consumer products and manufacturing.

Makers of computer and networking equipment, as well as network service providers, have the greatest need for temporary executives.

Many vendor firms hire temporary executives to fill a void while they search for permanent employees, push short-term projects out the door, or evaluate the executive's performance before hiring the person full time. End-user firms bring in temporary executives for some of the same reasons, says Steve Mader, managing director of Christian & Timbers' Boston office.

In both vendor and end-user firms, the positions experiencing the most growth are Internet software architects and Internet executives. This year, demand for these jobs is expected to increase by 198% and 99%, respectively.

People skilled in HTML, Java programming, database archi-

tecture and networking are needed to build the technology infrastructure and oversee development of key Internet applications. And as Internet companies mature, they need high-level managers with technical skills to further deploy their strategies.

Another hot job title is CIO for health care companies. This industry has long underinvested in information technology and is now seeking people who can lead the charge as they upgrade or expand their networks, even if those people have no health care industry experience.

Demand for chief technology officers, those expected to run a company's entire engineering and technology operation, is predicted to increase by 96% in 1997.

The number of information technology consultants, meanwhile, is expected to grow 65%, filling the void for companies that cannot staff quickly enough to implement technology.

The call center business also bears watching, Mader says. Over $1 billion worth of call center software and hardware is sold every year, much of it to outfit newly constructed facilities.

Jobs for people with sales, systems integration, customer service and operations back-

grounds are expected to grow 51% in 1997.

Which jobs are not so hot? About the only one even remotely related to networking is switchboard operator, with an expected drop in demand of 12% — the victim of increased voicemail and E-mail use.

But operators have nothing to worry about compared with car sales managers and tobacco executives. They lead the list of nine not-so-hot jobs, with expected 1997 declines of 67% and 59% respectively. ■

HOT JOBS

Job title	Predicted % growth
Temporary executive	314%
Internet software architect	198%
Health care CIO	121%
Internet executive	99%
Chief technology officer	96%
Vice president – year 2000	83%
Information technology consultant	68%
Vice president – call centers	51%

SOME NOT-SO-HOT JOBS

Job title	Predicted % decline
Car sales manager	67%
Tobacco industry executive	59%
General manager – semiconductor industry	39%
Administrative assistant	15%
Switchboard operator	12%

SOURCE: CHRISTIAN & TIMBERS, 1997

MANAGEMENT DATA ONLINE

Network World peruses online services for interesting tools or tips that will make your job easier or help you better manage your career.

References on request

InReference, Inc. has created a Web site that lets users search approximately 20,000 Usenet news groups and 130,000 electronic mail lists and Web forums with a single search. The service is free but requires registration for access to advanced capabilities. Such advanced features include the ability

Has 3Com stock rebounded? Find out on Fusion, along with:
● Other 3Com and U.S. Robotics financial info
● Recent announcements made by the two companies

Enter the number to the right in the DocFinder box on the home page. 1022

to write database queries to narrowly define your searches, and the ability to store a query on the site and have it run automatically on specific days.

InReference uses spiders to collect information from newsgroups, Web forums and E-mail lists. The data is stored in an Oracle Corp. database management system. Search tools on the site are based

on Verity, Inc.'s Search 97 technology. In addition, InReference has licensed the Stanford Information Filtering Tool (SIFT) from Stanford University's Center for Information. SIFT was specifically designed to search newsgroup archives.

Standards search

The American National Standards Institute (ANSI) has brought to fruition a plan to link the databases of 25 standards developers worldwide through its National Standards Systems Network: A Global Standards Network site. After years of development and beta testing, ANSI unveiled a fully operational basic service on the site last month.

The free service enables users to search for standards by keywords, by description or by full or partial document number. Search results will give the full names and numbers of standards that match search criteria, as well as hotlinks to each standard developer's site.

An enhanced service, due out in the second quarter, will provide richer information about each standard, such as an abstract, a listing of equivalent standards and pricing information.

The enhanced service carries a yearly subscription fee of $495 for a single user, $895 for five users and $1,695 for 10 users.

SENIOR SOFTWARE ENGINEER for software development company: Will perform feasibility studies; EDP requirement analysis, study of enterprise-wide software systems; will provide solutions and accordingly plan, layout & design methodologies for implementation using Object Oriented Techniques to produce high quality technical documentation; perform systems analysis, design, coding & testing of large-scale client server applications; will design database systems & maintain complex software systems on multiple operating system environments including Windows 3.1, Windows 95 & Windows NT: will design & implement windows compatible Graphical User Interfaces & supporting data structures; will develop custom reports & installation programs for all platforms; will travel 30-35% of time to client sites to customize and implement software. Require M.S. in computer science and either 2 yrs. exp. in described duties or 2 yrs exp. in software design/development to include min. of 1 yr. working with C, C++, MFC, ODBC, Crystal Reports, InstalShield, and Relational Databases. Hrs. 8 am - 5 pm Mon-Friday. Salary: $54,000 per yr. Must be authorized to work in U.S. Qualified applicants should apply with resumes only to: GA Dept. of Labor, Job Order #GA6072457, 465 Big Shanty Road, Marietta, GA 30066-3303 or to the nearest Dept. of Labor Field Service Office.

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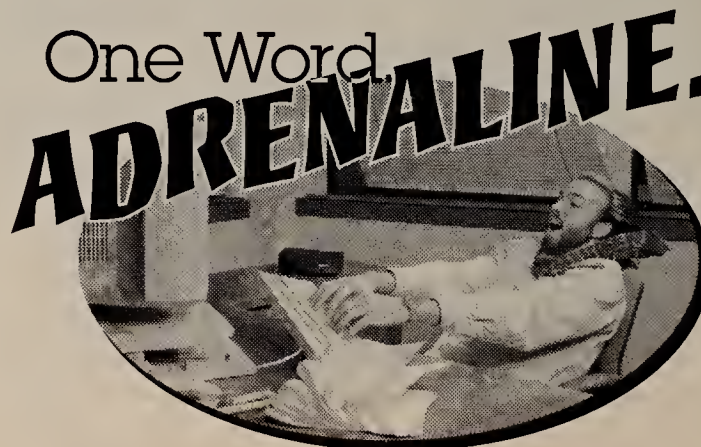
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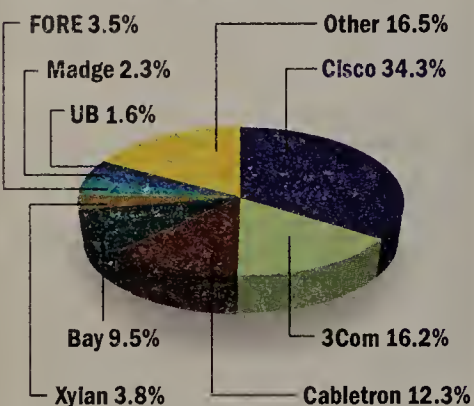
Life at the top of the internetworking game has been very good to Cisco — much like life at the top of the data processing world continues to be good for IBM.

"We have a number of clients who remark that, 'No one ever got fired for buying Cisco,'" said David Passmore, president of consultancy Decisys, Inc. in Sterling, Va.
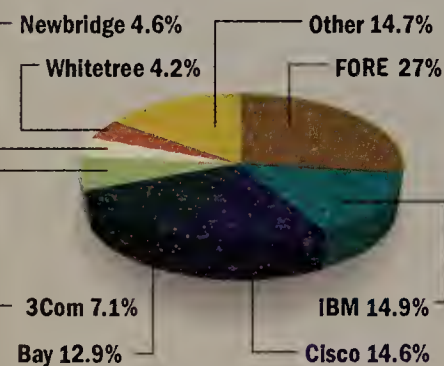
CISCO SHOWS SWITCHING STRENGTH

1996 worldwide switched Ethernet market

- FORE 3.5%
- Madge 2.3%
- UB 1.6%
- Bay 9.5%
- Xylan 3.8%
- Other 16.5%
- Cisco 34.3%
- 3Com 16.2%
- Cabletron 12.3%

Based on total revenues of $3.6 billion

1996 worldwide switched ATM market

- Newbridge 4.6%
- Whitetree 4.2%
- 3Com 7.1%
- Bay 12.9%
- Other 14.7%
- FORE 27%
- IBM 14.9%
- Cisco 14.6%

Based on total revenues of $470.9 million
SOURCE: DELL'ORO GROUP, PORTOLA VALLEY, CALIF.

Yet Cisco is starting to display some of the tendencies that suited then uprooted IBM over the past three decades, say users and analysts. Like IBM, Cisco is dominant, influential and possesses remarkable marketing adroitness; and like IBM, Cisco may be falling victim to its own success by growing so big that it could lose its time-to-market agility, opening up opportunities for rivals and start-ups.

And the coup de grace, according to some — despite Cisco's vehement denials — is a proprietary bend that locks customers into Cisco products, ensuring profitability through account control. But there are also those who argue that standards defuse innovation, and account control is Economics 101.

Regardless, Cisco does not welcome comparisons to IBM.

"Absolutely under no circumstances are we striving to [emulate IBM]," said Selby Wellman, senior vice president of Cisco's business units who previously spent 15 years at IBM. "The model IBM followed was a technical model that was very proprietary. We don't follow that model at all."

But the model may be following them. There are indications that Cisco may be feeling Blue these days due to delays in coming out with products and technologies to boost routing performance — especially for the Internet — and for adding routing to LAN switches.

Meanwhile, during a six-week period from Jan. 21 to March 4, Cisco's stock price plummeted 20 points. Though some of that drop reflects industrywide softness, analysts said some Cisco-specific issues are at play, as well.

"Cisco has a long-term consideration: ATM is going to force them to reshape their business model," said Gina Sockolow, an analyst at Schroder Wertheim & Co. in New York. "How many people need a big router?"

The product delays indicate Cisco, like IBM, has grown so large that it has lost the ability to quickly turn around products. Smaller companies are more nimble than Cisco and are threatening to saw the legs off of Cisco's throne, much like Microsoft, the PC clone makers and Cisco did to IBM.

Internet routers, 80% of which are Cisco's, have been dropping packets for three years now. But Cisco has yet to unveil the Big, Fast Router (BFR), a multigigabit, multimillion packet/sec beast that has been in the works for two years. Reports have it that some BFR developers got so frustrated with the router's slow development they left Cisco to develop BFR knockoffs at start-up companies such as Juniper Networks, Inc., Avici Systems, Inc. and Pluris, Inc.

Cisco will ship BFR later this year, Wellman said.

Meanwhile, it was another start-up — Ipsilon Networks, Inc. — that opened the industry's eyes to IP Switching, a method for boosting the performance of IP routing by doing, well, less routing. Ipsilon has

been shipping its IP Switching products, which require an ATM switch, for almost a year, and the company claims it has more than 30 customers.

Cisco responded by announcing Tag Switching, a cut-through mode of routing that supports multiple protocols — not just IP, like Ipsilon's IP Switching — and can operate over packet and cell infrastructures. But Cisco has yet to ship Tag Switching on any of its products, and indications are that the company is "slow-rolling" a standard in this area to buy time to release it (NW, Feb. 17, page 1).

Lastly, Cisco has yet to ship a Layer 3 LAN switch, even though it has been touting its Catalyst 5000 as multilayer-capable for two years. Cisco has been leapfrogged by Digital Equipment Corp. and Madge Networks, Inc., and may be overshadowed by Bay Networks, Inc. when Bay ships its Switch Node in May. Wellman acknowledged that Cisco's greatest challenge is its growth and how to manage it. As for the delays with BFR, Tag Switching and Layer 3 switching, other companies do not have the installed base issues to deal with that Cisco does.

"What we have to do is not only build a best-of-class product, but it has to be evolutionary with what's already out there," Wellman said. "If the jet is flying at 600 miles an hour, we have to slide a solution in without the plane slowing down."

Cisco is never more than six months behind any start-up company in releasing new products or technolgies, Wellman said.

Others said Cisco is delaying some products because it retains a router-centric view of the world, much like IBM had mainframe myopia. Cisco is late with Layer 3 switching because it threatens its core router business, said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

"They have the capacity to do Layer 3 switching, but they haven't really exploited it yet," McConnell said. "My belief is that would have some impact on routers."

Others agree with the router-centrism — to an extent.

"Cisco is definitely still touting the router as the heart of the network," said Tim Carmody,

> *"What we have to do is not only build a best-of-class product, but it has to be evolutionary with what's already out there,"*
> *Wellman said.*

technical director at IPC Information Systems, a New York-based systems integrator. "[But] I really think with their [switching] products, they're keeping their options open."

Wellman said the myopia lies with those who view Cisco as router-centric. He expects Cisco's switching revenue to overtake router revenue within a year.

"If there's one thing I could wish for Cisco today in terms of how we're viewed, it would be for the world to quit referring to us as a router company," Wellman said. "We're the No. 1 player in LAN switching. When we bought StrataCom we're now the No. 1 market leader in WAN switching."

And the way for Cisco to stay No. 1, be it in routing or switching, is to inject the market with its Internetwork Operating System (IOS) software, the common thread throughout Cisco's diverse product line. Like IBM's SNA, IOS is laced with proprietary hooks to lock standards-demanding customers into a Cisco-only circumstance.

Bunk, Wellman said. IOS is built on standards— both industry-defined and Cisco-defined. And that Cisco licenses IOS, even to competitors, is indicative of its openness; IBM did not license anything until APPN in the 1990s, Wellman noted.

But it is the "Cisco-defined" standards that has some hanging the proprietary shingle on IOS. "It's the same thing that IBM at one time thought: If they created the standard and it was de facto, then they adhered to the standard," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

And licensing IOS does not necessarily make it open. Cisco maintains control over IOS' development as well as over who gets the software, as demonstrated by the termination of Cabletron Systems, Inc.'s license (NW, Oct. 14, 1996, page 1).

"They're just incorporating IOS inside of [other products] so it's becoming a single-vendor solution in kind of a multivendor platform," said Todd Grigsby, network operations manager at the American Association of Retired Persons in Alexandria, Va.
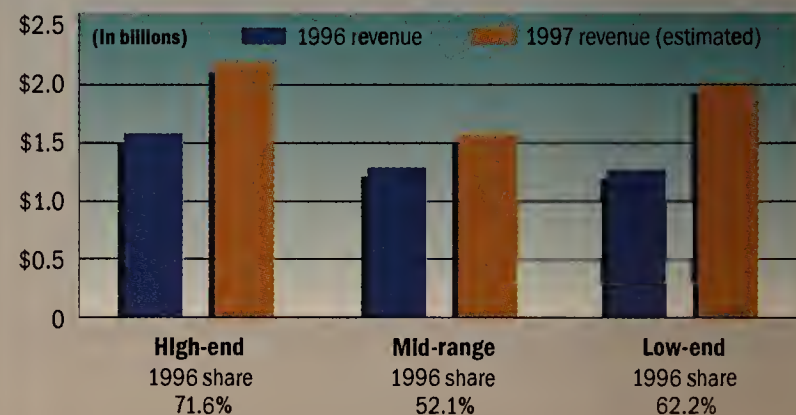
Despite the single-vendor flavor of IOS, some large Cisco/IBM shops said they still retain control of their own destiny. Financial services giant USAA is spending $100 million to overhaul its data network with Cisco gear (NW, Nov. 18, 1996, page 14).

"I think that IBM moved in account control because businesses allowed them to do it," said Sally Grant, assistant vice president of network development and sustainment for the San Antonio, Texas, firm. "I think our business is establishing a partnership; where it makes sense for [Cisco] to be here, they will, and where it doesn't, [they] won't."

Big or small, fast or slow, standard or nonstandard, Cisco — like IBM — is showing the machi-

AN INSTALLED BASE TO PROTECT

Cisco accounts for the lion's share of worldwide router revenue.

(In billions) ■ 1996 revenue ▨ 1997 revenue (estimated)

	High-end 1996 share 71.6%	Mid-range 1996 share 52.1%	Low-end 1996 share 62.2%

SOURCE: DELL 'ORO GROUP, PORTOLA VALLEY, CALIF.

try-defined and Cisco-defined. And that Cisco licenses IOS, even to competitors, is indicative of its openness; IBM did not license anything until APPN in the 1990s, Wellman noted.

nations of a growing, successful company with a loyal customer base, albeit with some of the same vulnerabilities as IBM. In other words, it is business as usual.

"There's nothing going on that's sinister; there's nothing going on that's unusual," said Thomas Nolle, president of consultancy CIMI Corp. in Voorhees, N.J. "All that's going on here is businesspeople trying to make a buck. And if we expect the marketplace to be anything other than that, we're smoking dope." ∎

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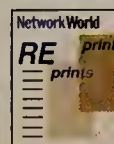
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Sun

For protection, the browser includes a digital signing feature that lets you check the source of a signed applet and make sure it was not modified between the time it was sent and received.

HotJava handles the usual alphabet soup of Internet application and transport protocols: HTTP, Simple Mail Transfer Protocol, Multi-purpose Internet Mail Extensions, File Transfer Protocol, Gopher and HTML 3.2, plus tables (see graphic, page 1).

New media types or protocols can be added through applet plug-ins as they are developed. HotJava also has what Sun calls a flexible HTML parser that flags HTML syntax errors on Web pages in order to reproduce pages satisfactorily, even with buggy HTML code.

Unlike Netscape Navigator and Microsoft Explorer, HotJava is not branded with its maker's logo. Instead, corporations can put their own logo on it and customize the browser's use by department or division. This may help Sun, which is positioning HotJava as ideal for a network computer (NC).

Some software and hardware manufacturers, including Adobe Systems, Inc., Oracle Corp., IBM, CyberCash, Inc. and Mitsubishi Corp., have already licensed the HotJava browser.

But the product comes with a quirky proviso: You have to download Sun's 9M-byte Java Developers Kit (JDK) 1.1 and install it on your computer. That is because HotJava requires JDK 1.1's new Java Virtual Machine (JVM) made available just last month. With an NC or an operating system running the new JVM, however, this will not be necessary.

"You can extend the HotJava browser by adding applets," JavaSoft's Amos says.

But Ann Thomas, senior consultant at the Boston-based Patricia Seybold Group, Inc., said even the prospect of a big download will not stop HotJava. "Just start the download and go to lunch," she said. Then put the code up on the LAN server to distribute it on the corporate intranet, Thomas suggested.

How hot is it?

Even though HotJava is free for end users, Sun may not shoot right to the top. "It would be surprising if Sun gains rapid market share with HotJava," said Evan Quinn, research director of Internet software at Framingham, Mass.-based consultancy International Data Corp. But over the next year or so, HotJava could make inroads as Java becomes a more strategic platform for corporate networking, Quinn added.

Thomas was more sanguine about HotJava's prospects. "Where this is really going to be popular is on the NC machine," she said.

Last week, IDC predicted sales of thin-client NCs would reach 565,000 this year. This is still just a fraction of overall PC sales.

More hot news

Sun will also burn bright this week when its SunSoft division announces Hewlett-Packard Co. has licensed Sun's Java Workshop tool kit to port it to the HP-UX Unix platform. HP plans to have a version of Java Workshop costing $99, with plug-in modules to optimize it for HP-UX, by June.

Sun's JavaSoft division last week released the beta versions of the Java Web Server and a tool kit for developing "servlets," server-side counterparts to applets.

A term coined by Java inventor James Gosling, servlets running on the Java Web Server can be used to replace cumbersome Common Gateway Interface scripts in serving up static Web pages or supporting search engines and customized applications.

The beta version of the Java Web Server also runs on the JDK 1.1 virtual machine so anyone wanting to use the Java Web Server has to download the final version of the JDK 1.1, as well.

Administrators can set up the Java Web Server to run servlets only if they are digitally signed. The servlets can also run in untrusted mode without signatures, according to Sandeep Khanna, SunSoft engineering manager.

According to Carol Amos, product-line manager at Java-Soft, Java servlet APIs should be finalized by mid-spring. ∎

NSF

vately held company took in approximately $51 million in registration fees between late 1995 and this Jan. 31.

Under its cooperative agreement with the NSF, NSI keeps 70% of the fees and sets aside the rest for public investment in the Internet.

But NSI claims it has actually lost money on the registration business in the past two years, because of the high cost of keeping up with the explosive growth in domain name requests.

"This is a tremendous undertaking," said Christopher Clough, NSI spokesman. The company registers names in the .com, .edu and .org domains.

The report apparently took many NSF officials and Internet observers by surprise. A task force set up by the Internet Society, which includes a representative of the NSF, recently recommended the creation of dozens of private registries and a nonprofit organization to oversee them. The government's contract with NSI is set to expire next year.

"It's surprising because it would have seemed that the NSF had been moving in the opposite direction," said Don Heath, president and chief executive officer of the Internet Society.

In addition, the NSF may not even be allowed to implement the recommendations under its current charter.

Several sources familiar with the report said the NSF was set up to disburse funds — not to generate them. Congressional action might be necessary to modify the charter.

NSF officials said they could not comment until they formally prepare a response to the OIG's report.

The OIG acts as an independent watchdog over the NSF, reporting directly to Congress and the National Science Board, which oversees the NSF.

"They take a look at NSF practices to make sure we are staying in line," said Beth Gaston, a spokeswoman for the NSF.

The OIG reportedly gathered reams of documents from the Internet and from the NSF to prepare the report. But the office has not yet made the report public and tried to keep the investigation quiet.

"We were not contacted in any way whatsoever," NSI's Clough said.

Scott Bradner, a member of the Internet Society, said he could not discuss the report, but added that it did not make sense for the NSF to start doling out Internet domain names again.

"In general, NSF should get out of the business," Bradner said. ∎

LURE OF DOMAIN NAMES

The inspector general is eyeing domain name registration as a new revenue source.

- **Registration fee:** $100 for first two years, then $50 per year
- **Enacted:** Sept. 1995
- **Revenue generated:** $51 million (through Jan. 31)
- **NSI's share:** $35 million
- **Set aside for investment in the Internet:** $16 million
- **Profit:** NSI said it lost money in 1995 and 1996.

Tired of .com

Ready to switch over to .web? Or .rec? Or .nom? It could be a long wait. An Internet Ad Hoc Committee (IAHC) plan to add seven generic top-level domain names and appoint dozens of new registries by lottery hit a legal snag last month when a rogue registry claimed it owned the exclusive rights to one of the names — .web.

Chris Ambler, president of Image Online Design Co., claims his company has registered more than 1,000 secondary domain names under the .web domain since Aug. 1, 1996, and that the IAHC plan infringes on his intellectual property. The IAHC, a task force created by the Internet Society with representatives from several 'Net groups, issued recommendations last month.

Though fewer than 1% of directory name servers actually recognize Ambler's .web registrations — making them practically useless — a number of individuals and companies have paid $35 a piece to reserve prized names such as love.web.

Now Ambler wants a judge to block the IAHC proposal and order the Internet Assigned Numbers Authority to program its root servers to begin recognizing the names he registers. He has also asked for unspecified damages.

A handful of other Internet users have also organized against the IAHC proposal. A small group, calling itself the Enhanced Domain Name Servers, proposed letting anyone become a registry and allowing them to use any unclaimed domain name.

— *Todd Wallack*

Backspin

Clone, clone on the range, where the macro viruses play

This week's column comes in fits and starts and is brought to you by the letter "IRS audit notification" and the imaginary number forty-eleven.

Fit the First: Here at the Gibbs Institute for Duplication, Duplication, Duplication and Copying, we are excited by the recent breakthrough in cloning. No, not PC cloning but biological organism cloning.

The reason? It was announced on Feb. 23 that scientists at the Roslin Institute in Scotland had successfully cloned an adult mammal. Specifically, they bio-xeroxed a sheep. (The clone's name is Dolly, not that it matters, but I note that, as usual, the media couldn't report a story like this without adding a dose of gut-wrenching cuteness. But I digress.)

Mark Gibbs

Now, if you're not up on biology, the significance of this event may have escaped you, and I am not about to try to explain why it is a breakthrough. Suffice it to say, until this announcement, producing true genetic duplicates wasn't thought possible. A side benefit of this research may be that, in the future, you'll know every time you eat lamb, you'll be eating the same lamb.

If you clone people in the computer industry, you can establish the world's greatest support team.

Now, it occurred to us in one of our late-night think-tank sessions ("paartay!") that we could clone people in the computer industry. Just think, in your group you've got one or two superb support people. Clone 'em.

You could establish the world's greatest support team. (All you've got to do is raise them from babies — a mere 18 years, and you're in business.) The same idea could be applied to programmers, analysts or any other functionaries you're short.

Now, other than producing armies of pocket-protector festooned lackeys, what else could we do? Hmmm...well, we could clone some of the people related to the computer industry. Here's a few of our thoughts:

My editor: What a superb idea to be able

to bless humanity with more specimens of this wonderful human being [Toad. Ed.].

Larry Ellison: We don't want any more of these; the planet's ego space is too small.

Bill Gates: As with the Larry Ellison clone, there's a problem here — the planet's not nearly rich enough for more than one, Bill.

Phillipe Kahn: See the Larry Ellison entry.

Vice President Al Gore: Nope. One is of little use to us. More than one wouldn't change a thing.

The IETF: Yes, yes, yes! The only group that's really driving standards that matter. The more, the merrier.

Reed Hundt: Not a good idea, and unless we can find some mosquitoes trapped in amber that once bit him, there's the practical problem of not being able to get DNA samples from fossils.

IBM salesmen: Too late! It's been done.

Fit the Second: Viruses. I mentioned a couple of weeks ago that I had gotten some peculiar error messages from Word for Windows. Although I didn't voice my suspicions at the time, it turned out to be what I suspected: a macro virus.

These wretched things (there are actually four of them with significant circulation) basically foul things up. For example, one of them prevents you from saving documents as anything but templates. This is unbelievably aggravating.

Worse still, the virus slipped in under the radar of the antivirus product I was relying on! I need to talk to (disembowel) the vendor. The other tool I tried found the viruses (yep, I had two: MDMA and Wazzu) and said it had fixed the problem, but actually didn't. More later on these vendors when I've had a chance to do some research. (By the way, if something like this has happened to you, drop me a line. I'm starting to wonder whether virus products let us down more than is reported.)

In the end, I downloaded an evaluation copy of Dr. Solomon's Anti-Virus Toolkit (www.drsolomon.com), which solved my problems with great ease (and without which this column could not have been written). My heartfelt thanks to that product for a sound and simple solution.

So send me your cloning plans and virus angst at nwcolumn@gibbs.com, or lay it on me at (800) 622-1108, Ext. 504. Beam me up, Scotty, the elevators aren't working again.
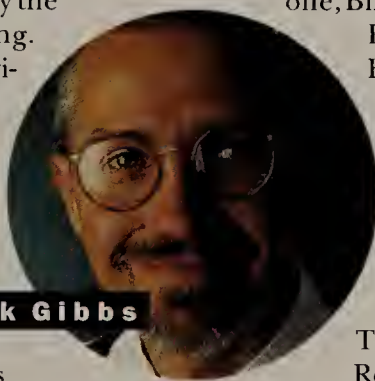
'Net Buzz

The latest on the Internet/intranet industry

By Chris Nerney

'PSST. HEY, MISTER, WANNA BUY A MICROPAYMENT SOFTWARE START-UP?' About three months ago, we reported on the turmoil surrounding flailing Internet micropayment software company **Clickshare Corp.**

The Williamstown, Mass.-based start-up was searching for a new CEO after an unidentified Internet "heavyweight" balked at taking the job at the last minute. In addition, several executives and board members resigned in December, citing the heavyhandedness of Clickshare co-founder and majority stockholder **William Densmore.**

Turns out those were the good ol' days.

In a move that can only be described as bizarre, even by cyberspace standards, former marketing director **Felix Kramer** last week posted a Web page updating the world on the Titanic cruise that is Clickshare.

He reports that Densmore and the remaining board members resigned on Feb. 28 and closed down the Clickshare prototype page that demonstrated the software designed to allow Web sites to track and charge users on a per-click basis.

Kramer, who was part of the December exodus but remains a shareholder, then virtually begs someone to buy Clickshare.

"Do you know of any possible purchaser?" he writes. "A buyer could be a content provider, an ISP, a telco or any other entity that who would launch the service."

If you think you might want to buy Clickshare, or if you are into schadenfreude (deriving enjoyment from the suffering of others), you can find Kramer's message at www.nlightning.com/clickshare/forsale.html.

TIME TO FACE THE BITTER TRUTH It's 3 a.m. and you, the network manager, are wide awake, filled with doubt and self-loathing as you stare morosely at your company's Web site, the one *you* designed, its glaring inadequacies mocking its pitiable creator.

"If only someone with true wisdom and perspective could help make my Web site really rock," you sigh.

Well, for a hefty sum, 'Net Buzz would be more than happy to lend our illusory expertise. But if you seek input from someone who actually knows what they're talking about, we grudgingly recommend you drop by the Webcheck Learning Center at next week's **Internet & Electronic Commerce Conference** at the Jacob Javits Convention Center in New York.

Tuesday through Thursday, companies can have their Web sites reviewed on any of 24 stations by interactive media experts who will offer free advice on how to improve the site's flow and design, as well as how to entice visitors to take action.

The Internet & Electronic Commerce Conference, produced by **Expocon Management Associates** and organized by **Gartner Group Inc.**, is a business-to-business event that focuses on how to compete effectively online.

TAKE A TEST RIDE WITH DIGITAL Aiming toward end users looking to integrate the next Internet protocol into their networks, **Digital Equipment Corp.** is releasing a server that provides a connection to the global IPv6 test network.

IPv6, currently being developed by the Internet Engineering Task Force, is said to provide more efficient routing and improved performance for Internet applications, particularly real-time multimedia. The IPv6 test network — or "6bone" — offers 24-hour technical support and a range of Internet services designed to facilitate interoperability of IPv6 with the current IPv4 .

AlphaServer with IPv6 is a 64-bit desktop system that includes IPv6 prototype code and APIs for Digital Unix. It is priced at $9,505.

In addition to critiquing Web sites, 'Net Buzz offers psychological counseling, handwriting analysis, and the latest and best Internet and intranet news. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.
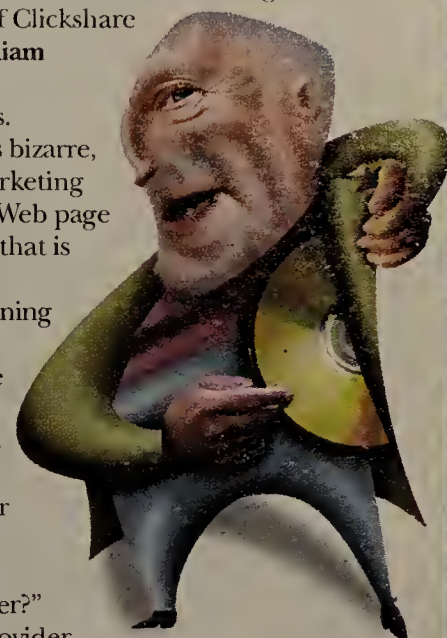
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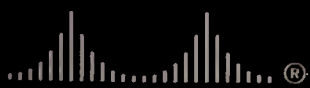
Some people find editorial comment more credible than advertising copy.

Cool.

PC World said, "The (IBM) Network Printer 12's $1250* street price is the lowest on the monochrome chart, and its two-pages-per-minute graphics speed is one of the fastest." (January 1997)

Computer Shopper said, "IBM has come up with a winning combination for medium-size networks... that need reliable, fast printing.... Installation of the Network Printer 17 on our Ethernet network was one of the quickest and easiest we've ever performed." (December 1996)

PC Magazine said, "The IBM Network Color Printer will satisfy the needs of both business users who need simple color output for reports and presentations and desktop publishers who want nearly photographic-quality output." (October 1996)

IBM Printing Systems Company says, "Call us now at 1 800 358-6661, choose the 'Printer Selection Center' option, and find out more about the network printers lots of people are talking about." If you'd like to read the reviews mentioned here, visit us at www.can.ibm.com/ibmprinters

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